AMERICAN
GAS JOURNAL

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The excellent performance characteristics of the EMCO "1001" Regulator are due to the inbuilt pilot loading system for diaphragm control. This method of loading, not previously available on medium and small size regulators, assures the movement of the main operating diaphragm with the slightest change in the control pressure. The desired outlet pressure is maintained at a definite and unvarying amount from minimum flow rates to the maximum capacities that can be obtained under existing pressure conditions and lock-up features are exceptional.

This regulator is designed to provide accurate control for installations having both small and large flow rates, where supply pressures ranging up to 150 lbs. must be reduced to 20 lbs. or less. In this category are large gas appliances, boiler plants and industrial heat-treating furnaces. The EMCO "1001" Regulator is also well suited to small town border station requirements and may also be employed for district regulator installations where systems are operated at intermediate pressures or at intermediate and low pressure combined.

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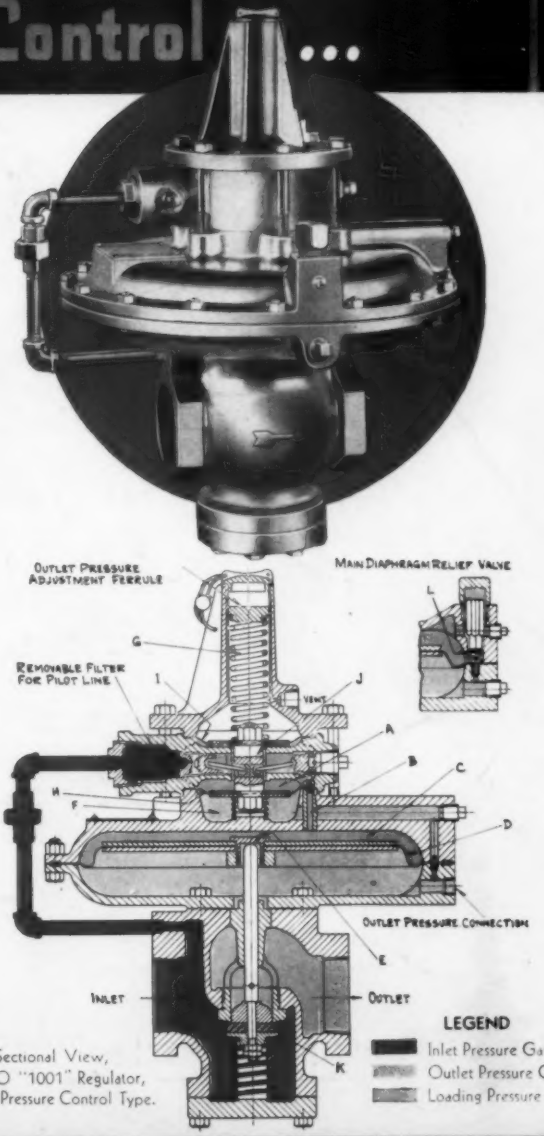
  Precision control now possible for the first time for utilization pressures normally encountered on industrial gas applications.
- ***COMPLETE ADAPTABILITY . . .***
  Covers practically all the regulation problems met with in normal gas practice.
- ***COMPACT DIMENSIONS . . .***
  Provides simple installation with respect to both space and connections.
- ***WIDE RANGE OF CONTROL . . .***
  Extreme accuracy now obtainable within the same assembly for outlet pressures ranging from 3 inches of water up to 20 lbs. per sq. in.



Sectional View, EMCO "1001" Regulator, Outlet Pressure Control Type.

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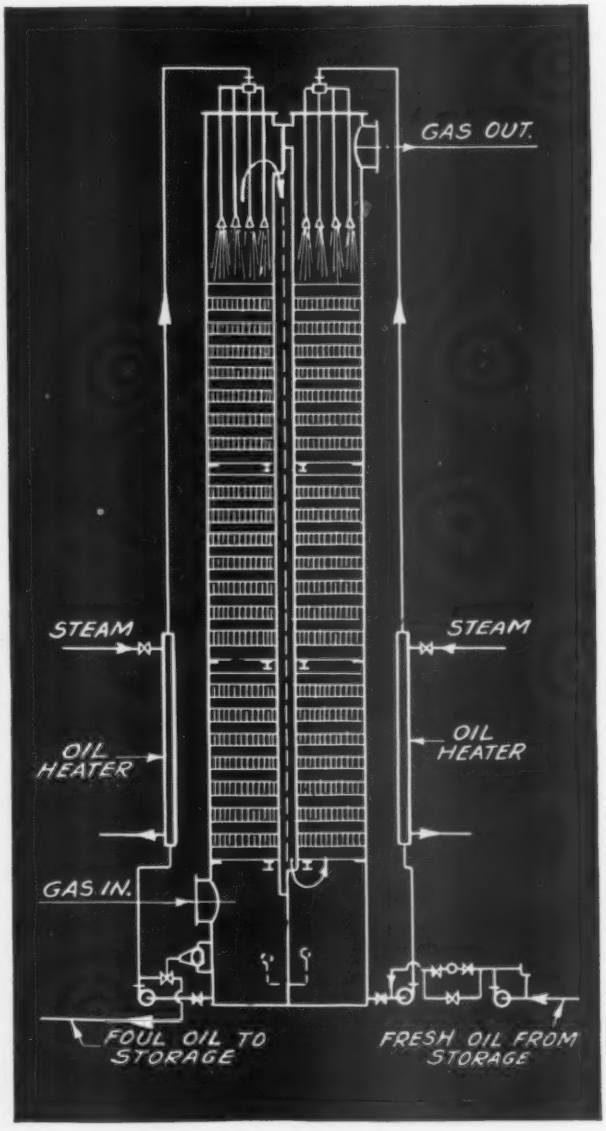
How much are you paying for *not* removing naphthalene?



The cost of operating a Semet-Solvay Oil Scrubber, even including interest on the investment, is so small that the important question is not how much it costs to operate it but how much you may be paying for *not* removing naphthalene and other impurities from your gas before it enters the mains.

Distribution troubles, and service calls that are so costly both in dollars and cents and in public good will, are being materially reduced where the Semet-Solvay Oil Scrubber is in use. As more and more of the modern type of gas appliances come into use, equipment for cleaning gas becomes more and more necessary.

The Semet-Solvay Oil Scrubber is of the two-pass type. Fresh oil is added *continuously* in a very small stream, thereby keeping the circulating oil always below the saturation point and assuring maximum absorption of naphthalene and other impurities with minimum use of oil. The fouled oil is not lost but is used for carburetion in the water gas set.

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for removing naphthalene and other impurities

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says Mr. S. B. Severson, Vice President, Dominion Natural Gas Co., Ltd.; Republic Light, Heat & Power Co., Inc. Read his letter.

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REPUBLIC LIGHT, HEAT & POWER COMPANY, INC.
AND ASSOCIATED COMPANIES
JACKSON BUILDING
BUFFALO, N. Y.

June 10, 1940

Mr. G. M. Kirkpatrick
Blaw-Knox Company
Pittsburgh, Penna.

Dear Sir:

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The first Blaw-Knox Cleaner to be used by us was at a distribution system town border station where complaint calls due to dust were occurring in alarming numbers. Within a few hours after placing the Cleaner in operation, a decrease in complaints was noted, and in about a month had almost ceased. This Cleaner is still in continuous operation.

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Yours very truly

Vice President

The part that Blaw-Knox Gas Conditioning plays in maintaining consumer goodwill, reducing service calls and protecting equipment is daily receiving increased recognition by gas companies. Proof of this is found in repeat orders from concerns who, having proved Blaw-Knox Gas Conditioners to their own satisfaction, buy additional units. Our Bulletin No. 1578 describes Blaw-Knox Gas Conditioning equipment in detail and explains why leading operating engineers prefer it. Ask for a copy.

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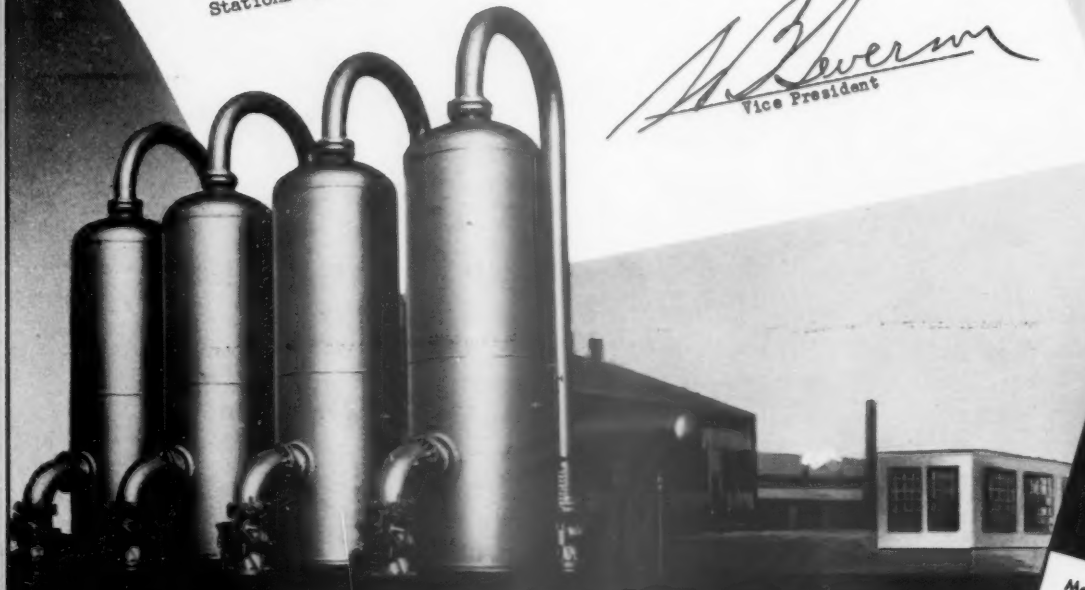
1. —High capacity, gives full value per dollar invested.
2. —Gas is thoroughly cleaned . . . no halfway measures. Dust and other foreign matter are dynamically forced into intimate contact with washing liquid.
3. —Delivers perfectly clean, dry gas. (If desired, equipment will resaturate with oil or water vapor.)
4. —Pressure losses cut. Very little loss in contacting and separating sections.
5. —Dust and dirt are completely removed from gas flow.
6. —Blaw-Knox Gas Conditioners are the result of many years' research and experience specifically directed toward meeting your requirements for the continuous delivery of clean, conditioned gas, the Ideal Fuel.



More than ever your profits depend upon gas flowing—smoothly, surely—through the burners of modern appliances. That's a test that only clean gas can meet. Banish burner-clogging with Blaw-Knox Gas Conditioning. Remember—clean gas makes satisfied customers.

BLAW-KNOX
GAS CONDITIONERS

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A. I. PHILLIPS, *Editorial Director*
H. T. MATTHEW, *Business Manager*
JAMES C. MUNN, *Midwest Representative*
10515 Wilbur Ave., Cleveland, Ohio
Tel. Garfield 1055
THOMAS MORGAN, *Western Representative*
168 N. Michigan Ave.
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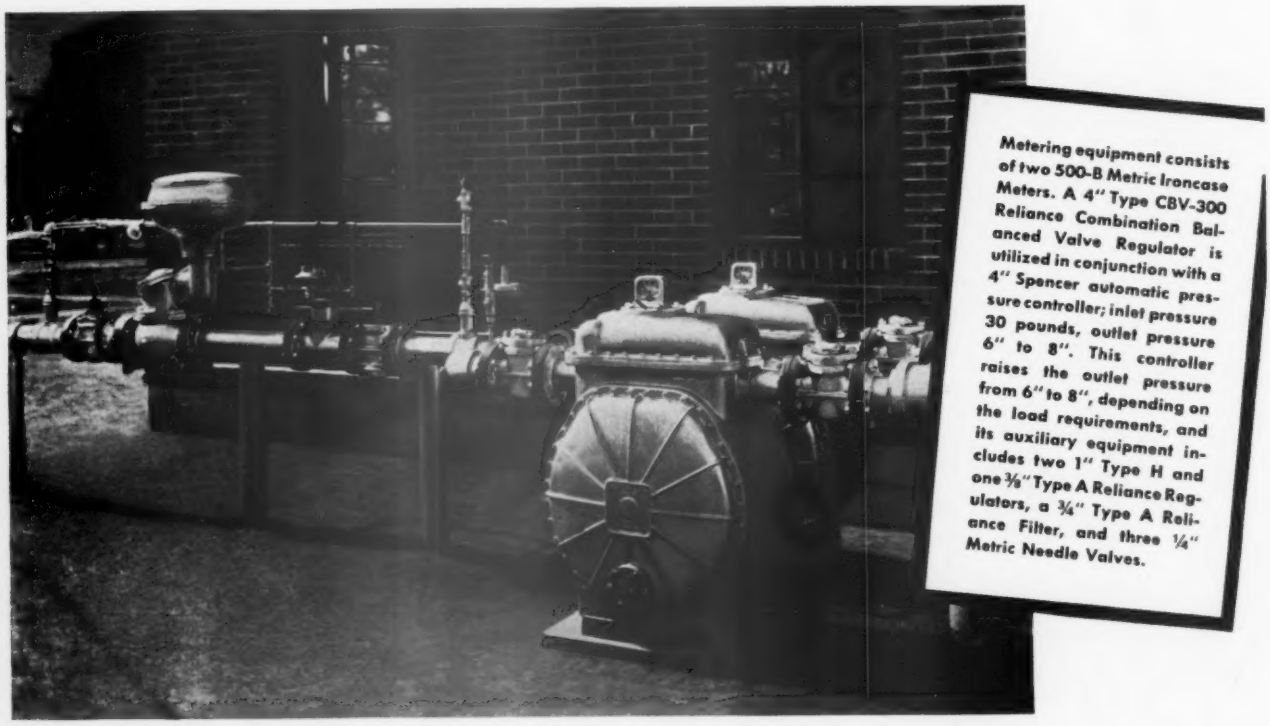
ANOTHER ALL-AMERICAN JOB

This model new master meter station was built by a leading gas company in the South, to measure gas to a large construction operation.

The meters and regulators specified for the installation were American Meter Company products, bearing the METRIC-AMERICAN or RELIANCE-AMERICAN trademark.

This gas company is exacting in its specifications on all counts relating to instrument accuracy, low maintenance, and long-term values. It is impressed only by actual performance and cost records.



Metering equipment consists of two 500-B Metric Ironcase Meters. A 4" Type CBV-300 Reliance Combination Balanced Valve Regulator is utilized in conjunction with a 4" Spencer automatic pressure controller; inlet pressure 30 pounds, outlet pressure 6" to 8". This controller raises the outlet pressure from 6" to 8", depending on the load requirements, and its auxiliary equipment includes two 1" Type H and one ⅜" Type A Reliance Regulators, a ¾" Type A Reliance Filter, and three ¼" Metric Needle Valves.

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1940

AMERICAN
GAS JOURNAL

VOLUME 153
NO. 3

Light Oil Recovery From Coke Oven Gas

By
W. Tiddy, Director of Research and
M. J. Miller, Distillation Engineer
Semet Solvay Engineering Corp.,
New York, N. Y.

As EARLY as 1860 it was known that light oil could be recovered from manufactured gas but, as the value of gas was judged in the early days by its candle power, the gas works and coke oven industries could not consider the recovery of light oil because its removal from the gas reduced the candle power below standard requirements.

The first commercial unit for the recovery of light oil from coke oven gas was built in Europe in 1885, and in 1898 the Semet-Solvay Company built the first unit in the United States, but not until 1913 did the United States producers become really interested in its recovery in appreciable volume. This was brought about by the exigencies of the World War when greater demands were being made for C/P benzol and toluol for the production of picric acid and T.N.T. for explosives manufacture.

The volume of crude light oil recovered from coke oven gas in recent years has been:

Year	*Production by By-Product Coke and Steel Companies* *Gallons*	*Production by Public Utility Companies* *Gallons*	*Total*
1935	129,863,850	3,832,950	133,696,800
1936	166,275,700	3,958,500	170,234,200
1937	183,223,820	3,830,520	187,054,340

The yields were from three to four gallons per ton of coal carbonized.

Most of you are no doubt familiar with this subject matter, but, in the event that some of you may consider it a new topic of interest to the gas industry, a few preliminary definitions and observations may help to clarify this presentation.

Light oil is a condensable vapor recoverable from coke oven and carbureted water gas and is one of the chief constituents of the illuminant portion of the gas.

The crude light oil recovered from coke oven gas contains benzol, toluol, xylol, naphthalene, and other heavy solvents in the approximate, varying compositions of:

Benzol	50-65%
Toluol	10-25%
Xylol	2-10%
Naphthalene	1- 3%

Benzol boils at 80° C. and when refined is used in the chemical industry for the production of aniline, phenol, picric acid, solvents, and many other chemicals. Large volumes of benzol are often blended with gasoline for use as a high anti-knock motor fuel. The merits of benzol-blended motor fuel, compared with the tetraethyllead type of gasoline, will not be discussed in this presentation as the topic of the next address will be the production of motor fuel.

Toluol boils at 110° C. and is largely consumed in the chemical industry for lacquer solvents, explosives manufacture (T.N.T.), and organic dye intermediates.

Xylol boils between 135 and 144° C. and is largely consumed in the chemical solvent industry but is also used for the production of organic dye intermediates.

Naphthalene, when purified, is a white, flaky substance with a characteristic odor, used for the production of moth balls and organic derivatives for the dye and lacquer industries.

The other solvents present are often converted or polymerized into para coumarone-indene resins.

This paper, presented at the Joint Committee Conference of the American Gas Association Production and Chemical Committee, is of particular interest at this time when securing an adequate supply of toluol has become an important feature of our national defense program.

Processes

Three different systems have been proposed for the commercial recovery of crude light oils from coke oven gas and are designated as:

First: Cooling and Compression System

Second: Adsorption System

Third: Absorption or Wash Oil System

The last-named is the preferred type for American practice.

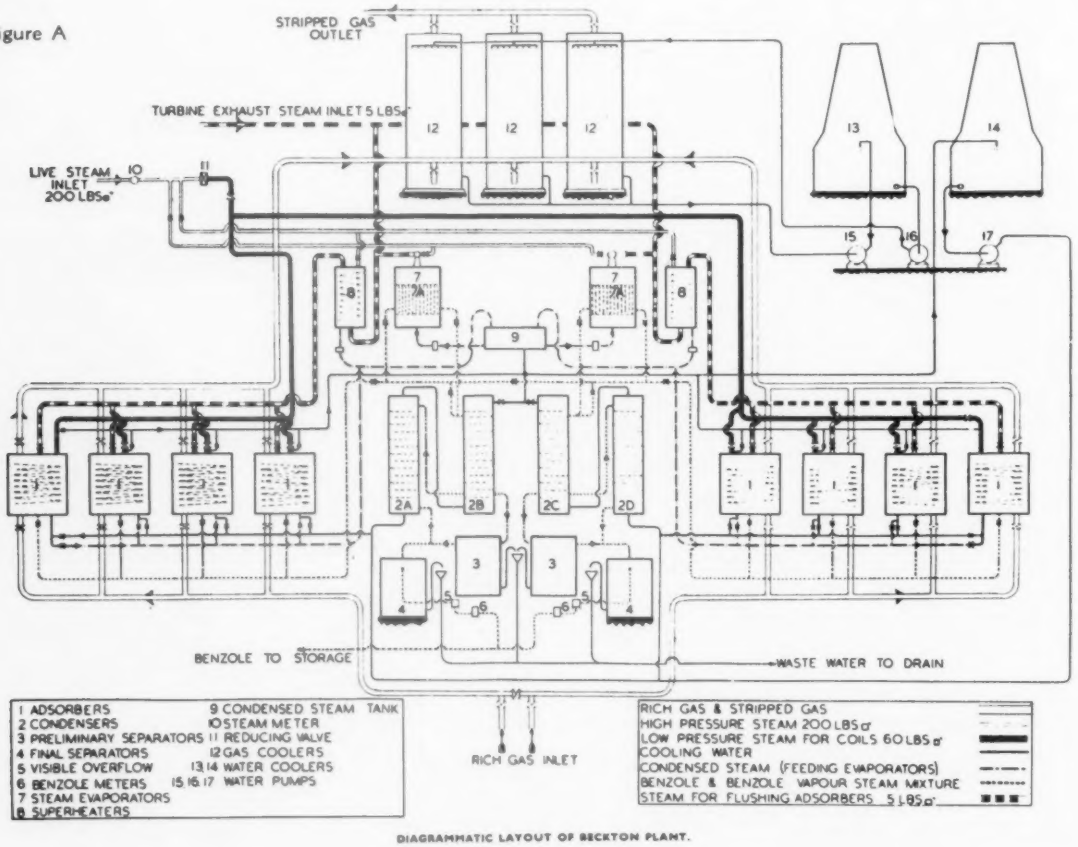
Cooling and Compression System

To recover light oils from coke oven gas by means of the cooling and compression system it is necessary to have the ammonia and tar completely removed. By cooling the gas to —50° C., most of the light oil is condensed, but for practical reasons it is better to combine compression and cooling in order to reduce the vapor pressure of the light oil so that the oil will condense at higher temperature (approximately —20° C. when the gas is compressed to 5 atmospheres). It is obvious that to compress all coke oven gas to 5 atmospheres considerable power is required.

The adsorption process is a two-stage one in which the light oils are first removed from the coke oven gas by passing the gas through a solid adsorption material such as activated charcoal, silica gel, or a similar product. In the second stage the light oil is recovered by steaming the enriched adsorbed material. It is important, however, to remove the ammonia, tar, and preferably hydrogen sulphide and cyanogen as well, from the coke oven gas before it is passed through the adsorbers.

There are no installations of this type in the United States, but, in order to give this meeting as much practical information as possible, advantage has been taken of an excellent description of an adsorption system plant erected at Beckton, England. This description of the plant and its operation, which follows, is a direct quotation from Page 377 and subsequent pages of the second edition of Messrs. Hoffert's and Claxton's book entitled *Motor Benzole, Its Production and Use*, published by The National Benzole ssociation, London, in 1938.

Figure A



DIAGRAMMATIC LAYOUT OF BECKTON PLANT.

This process has not been extensively used for coke oven gas operations, but it has been found useful in the recovery of light oil prior to the use of coke oven gas for the production of hydrogen for the synthetic processes in Europe.

Adsorption System

This system has been found of more practical use in England than in the United States, primarily, no doubt, on account of the difficulty of obtaining a cheap wash oil for the absorption or wash oil process in England.

"This installation, . . . is capable of producing 20,000 gal. of benzole in 24 hr. from 75 million cu. ft. of gas containing 2.9 gal. of benzole per 10,000 cu. ft. of gas free from hydrogen sulphide and naphthalene, when operating at an efficiency of 92.5 per cent.

"The layout of the plant, . . . is shown diagramatically in Figure A. It is arranged in two halves in such a way that both can be operated as one unit, or independently of each other. Each half has a separate gas inlet-main controlled by valves and contains four adsorbers, each holding about 7 tons of active carbon. These adsorbers are cylindrical vessels 9 ft. in diameter and 27 ft. in length, containing pipe coils for cooling and heating purposes, and carbon-supporting grids, which can be lowered in the centre for the purpose of discharging the carbon. The adsorbers are placed 11 ft. above the floor level to provide head room for discharging the carbon into closed dust-proof containers carried on special trucks running on rails. The other sections of the plant are also arranged as two units and comprise two steam regenerators, two sets of tubular condensers, two sets of preliminary separators, two final separators and two benzole meters. An underground installation of eight tanks provides storage for 100,000 gal. of spirit. Three gas-coolers adjacent to the plant, cool the stripped gas by direct contact with water and condense the water vapour, which has been taken up by the gas in passage through the steamed adsorbers. The water required for cooling is supplied by two sets of electrically-driven centrifugal-pumps and two

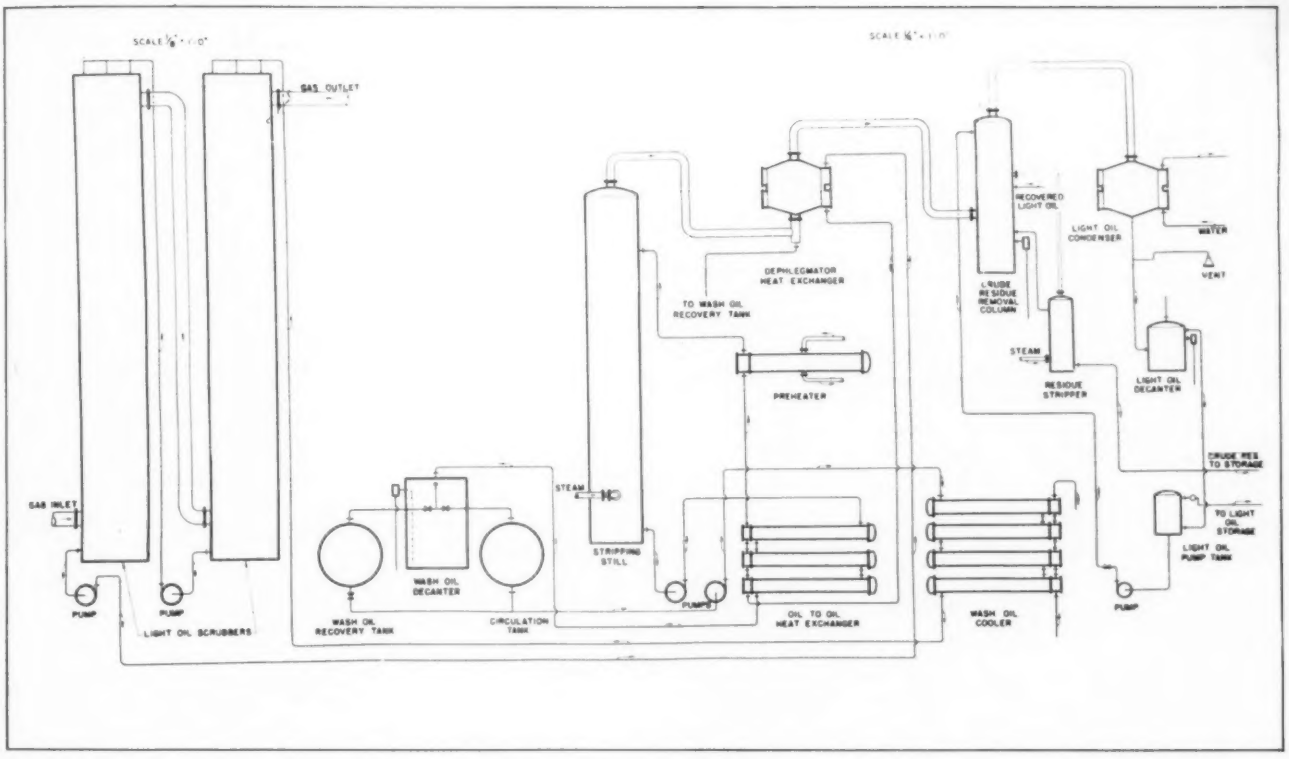


Figure B, Wash Oil System.

cooling towers. One circuit supplies the gas coolers, whilst the other is available for a battery of rack coolers, the benzole condensers, and the cooling coils in the preliminary separators. The rack coolers are part of a closed cooling-system, which was introduced later in order to minimize corrosion in the adsorber coils. Previously this was serious on account of the differential oxygen- and salt-concentration of the cooling water, and the condensed steam introduced into the coils during the adsorption process. The closed system is filled with condensed steam that is deaerated, so that no corrosion can arise from the causes mentioned.

"Operation of the Plant

"The quantity of gas that can be passed through an adsorber can be varied within wide limits, and the number of adsorbers at work is governed by the throughput and the adsorptive capacity of the carbon, depending on its age. In practice, the adsorptive capacity of the carbon in different adsorbers varies considerably, and this is allowed for by adjusting the respective gas-throughputs in inverse ratio to the adsorptive capacity of the carbon.

"When the plant is working at full capacity, five adsorbers are receiving gas, two are being steamed, and one is in reserve, or being recharged with carbon. Adsorption of benzole is continued until the break-point is reached.

"When an adsorber is saturated with benzole it is taken out of the gas stream, after another adsorber freshly steamed has been brought into action. The cooling water is shut off, and both indirect and direct steam are admitted at the same time. The temperature rises quickly and adsorbed and occluded gases containing ethylene and benzole are liberated almost instantaneously. These gases, after passage through the steam regenerators, condensers, etc., are returned to the inlet of the plant for readsorption of the benzole. After 5 or 6 min. steaming, the adsorber temperature reaches 80° C., when the benzole goes forward with the uncondensed steam to the steam regenerators, condensers and separators. Steaming takes 30 to 40 min. according to the age of the carbon, and at the end of this period the carbon is left at a temperature of about 120° C. and charged with about 15 per cent of water. On readmission of gas to the adsorber, the excess water is rapidly removed and the temperature of the carbon falls rapidly due to evaporation of the water. After 20 min., the carbon is in a condition such that cooling water can again be passed through the coils.

"Plant Results

"During operation, the adsorptive capacity of the carbon gradually falls, due to accumulation of polymerisation products (gum) in the pores of the carbon. Thus, the effective capacity of the carbon, which at first is about 25 per cent. by wt. or more, . . . gradually decreases and eventually becomes so low that the increased cost of steam exceeds the value of the carbon. This point is usually reached when the adsorptive capacity has fallen to about 5 per cent. The carbon is then removed from the adsorber and either discarded or regenerated. When the latter procedure is adopted, the original capacity of the carbon is almost completely restored, but its life is shortened. Moreover, the loss of carbon due to attrition, etc., incurred during regeneration has proved heavy."

Objections to Adsorption or Activated Carbon System as Applied to American Practice

1) Deterioration and replacement of activated carbon.
2) Corrosion of adsorbers.
3) Additional operating costs due to the preferred operation's requiring purified gas.
4) Intermittent operation, thus increasing labor and supervision charges, compared with those under the continuous oil washing process.
5) Increased cost of refining the benzol because of the higher sulphur content of crude benzol recovered by the activated carbon method compared with the benzol recovered by oil washing. For example, the sulphur content may be:

	Benzol Recovered by Activated Carbon	*Benzol Recovered by Oil Washing*
Sulphur as Carbon Bisulphide	0.7 –1.35%	0.25–0.4%
Other Sulphur Compounds ...	0.45–0.55%	0.3 –0.5%

Considering the importance of sulphur removal from the gas, it is apparent that the activated carbon process has little or no advantage in this respect in cases where the gas is not being used for city distribution.

Absorption System

The absorption or more commonly termed wash oil system is the one best adapted for American practice for three reasons:

1) Continuity of operations
2) Minimum amount of labor
3) Availability of a suitable wash oil

The theory on which the wash oil system is based differs from that of the adsorption system in that it depends on the solubility of the light oil in the washing medium, whereas the adsorption system depends on the capillary action of the pores of solid activated carbon or silica gel to retain the light oil.

Equipment Required:

Two (2) Scrubbers
Light Oil Stripping Still
Wash Oil Preheater
Vapor-to-Oil Heat Exchanger
Oil-to-Oil Heat Exchanger
Wash Oil Cooler
Wash Oil Decanter
Residue Removal Column
Side Stripper
Light Oil Condenser
Light Oil Decanter
Storage Tanks
Service Tanks
Final Cooler

Operation—Removal of Light Oil from Gas

The two scrubbers are installed in the gas main after the ammonia and tar removal equipment. For semi-direct ammonium sulphate by-product coke plants, a final cooler should be installed ahead of the two scrubbers in order to reduce the coke oven gas to approximately 25° C. The cooled gas leaving the ammonia equipment is passed through the two grid-filled scrubbers in counter-current contact with petroleum wash oil at a temperature of 2° C. above the temperature of the gas, in which operation the light oil is removed from the coke oven gas by absorption and the stripped gas, on leaving the scrubbers, is ready for distribution without further treatment.

In order to remove 95% of the light oil in the coke oven gas, a continuous wash oil circulating system (see Exhibit B) has been developed in which the enriched wash oil leaving the base of the scrubbers is pumped to the vapor-to-oil heat exchanger used in conjunction with the light oil recovery system, and, on leaving the vapor-to-oil heat exchanger, passes through the oil-to-oil heat exchanger to a preheater where it is heated to a temperature of 135° C. before entering a stripping still.

The hot wash oil, substantially stripped of light oil, leaving the base of the stripping still flows or is pumped to the oil-to-oil heat exchanger, giving up some of its heat to the incoming, enriched oil, and then flows to a decanter where any deposits or muck formations are separated and withdrawn periodically to the wash oil recovery system.

From the decanter the partially cooled, stripped oil flows to a wash oil circulating tank and from there is pumped to the wash oil coolers where it is cooled to approximately 25° C. for recirculation in the counter-current scrubbers.

Operation—Recovery of Light Oil from Absorbent

To remove light oil from the enriched wash oil, it is necessary only to steam-distill the enriched wash-oil, but in order to conserve heat, heat exchangers and preheaters have been developed for the more recent installations. (See Exhibit B.)

The enriched, preheated wash oil flows down through bubble cap trays in the stripping still counter-current to an upward flow of low-pressure steam entering the base of the stripping still. The mixed vapors of light oil and water leaving the stripping still are passed through a dephlegmator type vapor-to-oil heat exchanger and from there to the base of the crude residue separating column where the vapors are separated into two fractions by means of a light oil reflux flow pumped to the top of the crude residue separation column, counter-current to the up-flow mixture of vapors of light oil and water entering the base of the crude residue separating column.

The higher-boiling constituents, which have condensed, flow from the base of the crude residue separating column to the residue stripper where they are freed from any light-boiling fractions and flow from the residue stripper to the crude residue storage tank. The vapors leaving the crude residue separating column pass to a light oil condenser wherein they are condensed to a liquid state, flow to a light oil decanter for separation of any water, and overflow from the decanter's to light oil storage. Part of the light oil flowing from the light oil decanters is often used for reflux to the crude residue separation column.

Thus, with but little additional steam, the light oil leaving the stripping still has been separated into two fractions:

(a) Crude light oil containing all the benzol, toluol, and xylol.

(b) A crude residue contaiing naphthalene and some high-boiling solvents.

The importance of the crude residue separation column has been well demonstrated by the fact that it allows crude light oil containing all the benzol, toluol, and xylol, to be acid-treated in an agitator without a predistillation.

Operating Conditions

The following table represents typical temperatures and volumes found in operating a modern plant under atmospheric pressure conditions:

Temperature of gas entering scrubbers	20-25° C.
Temperature of wash oil entering scrubbers	22-27° C.
Temperature of wash oil entering stripping still	135° C.
Wash oil circulated per ton of coal carbonized	175-200 gal.
Fresh wash oil make-up per 10,000 gallons of wash oil circulated	2.5-4.0 gal.
Light oil recovered per ton of coal carbonized	3.0-4.0 gal.
Enrichment of wash oil leaving scrubber	2.0-2.3%
Steam per gallon of wash oil circulated (atmospheric pressure operation)	0.50-0.75 lb.
Light oil recovery from coke oven gas—average yearly rate	95%

It is to be noted that the fresh wash oil make-up is low in plants of modern design. However, this was not true in some of the previously built plants, partly because of the type of petroleum wash oil used, partly because of the temperatures of operation and the irregular temperature conditions in the scrubber system, together with dirty coke oven gas.

Experience in handling petroleum wash oils in light oil recovery systems has shown that a satisfactory petroleum wash oil can be secured so that a well-designed plant can be operated with a minimum of fresh wash oil make-up. It should be noted at this time that other types of oil, such as creosote oil, cresols, tetralin (hydrogenated naphthalene), have been proposed, but, either their break-down in operation, or the high vapor pressure of their constituents, has made these substitute oils impractical in this country.

In removing the light oil from coke oven gas, there results a reduction of Btu in the stripped gas. The effect of this removal on the Btu in coke oven gas is noted in the following table:

(*Continued on page 46*)

Distinctions Between Municipalities and Gas Corporations

By
Leo T. Parker

Attorney at Law
Cincinnati, Ohio

IT IS well known that there are many and varied legal distinctions between municipalities and gas corporations.

First, we shall consider the legal rights and duties of municipalities. We may define a municipal corporation in its historical and strict sense to be the incorporation, *by the authority of the government,* of the inhabitants of a particular place or district, and authorizing them in their corporate capacity to exercise subordinate specified powers of legislation and regulation with respect to their local and internal concerns. This power of local government is the distinctive purpose and the distinguishing feature of a municipal corporation proper.

While the phrase "municipal corporation" usually is used in the strict sense, yet sometimes it is used in a broader sense that includes also public or quasi corporations, the principal purpose of whose creation is as an instrumentality of the State, and *not* for the regulation of the local and special affairs of a compact community.

For example, a municipality which is authorized to manufacture and sell gas is not, in a strict sense, a pure municipal corporation. In other words, its usual or ordinary powers must be broadened by state laws before it can enlarge its ordinary powers of legislation and regulation of its internal affairs.

The rule has long been established that a municipal corporation possesses and can exercise the following powers and no others: First, those granted by state laws in express words; second, those necessarily or fairly implied in or incident to the powers expressly granted; third, those essential to the declared objects and purposes of the corporation not simply convenient, but indispensable.

The powers granted to a municipal corporation can be divided into two general classes,—the one including those which are legislative, public or governmental, and import sovereignty; the second, those which are proprietary or quasi private, conferred for the private advantage of the inhabitants and the city itself as a legal entity.

Another important point of law is that state statutes granting expressed powers to municipalities are strictly construed by the courts, and where any doubt exists as to the meaning of a state law such doubt must be resolved against the municipality.

Right of City to Sell Gas Appliances

Considerable discussion has arisen from time to time whether under ordinary state laws a municipality may automatically extend or enlarge its field of operations.

For illustration, one very important question of law, that has been before recent courts for discussion, is whether a state law which expressly authorizes municipalities to engage in the business of supplying gas to domestic and industrial consumers can be construed to imply that municipalities may also sell gas appliances. This point of law was decided by a higher court in Nelson-Johnston & Doudna v. Metropolitan Utilities Dist., 291 N. W. 559, reported May 8, 1940.

The facts of this case are that the city of Omaha is a municipal corporation created in the usual manner by the laws of the state of Nebraska. The municipality was empowered by these state laws to engage in the business of supplying the inhabitants of the city with gas, and to manufacture and produce coke and by-products in connection with the operation of its gas plant, and to sell and deliver the same to its customers.

Although the state laws do not specifically or expressly authorize municipalities to sell gas appliances, yet the city of Omaha for many years has been engaged in the sale at retail of gas ranges, gas stoves, gas heaters, mechanical refrigerators, and other household appliances. The city is now operating a retail appliance store and is selling and offering for sale gas stoves, gas ranges, gas heaters, mechanical refrigerators and other household appliances. It carries on an extensive advertising campaign, including the giving to its customers free merchandise and articles used in connection with the cooking and preparation of foods, and it extends to its patrons unusual and long terms of credit on merchandise sold which private competitors cannot meet.

Suit was filed against the municipality on the contention that the state law must be interpreted in strict accordance with its terms which do not expressly authorize municipalities to engage in the business of selling gas appliances. It was further alleged that the municipality should not be permitted to sell gas appliances because there are numerous private mercantile establishments engaged in the gas-appliance business in the city, that there is no scarcity of such appliances, and no price fixing by dealers, combinations or trusts to stifle competition or thwart the beneficient results of free enterprise. In other words, it was contended that the municipal corporation is unlawfully engaged in the gas-appliance business contrary to the expressed statutory law. However, it is interesting to know that the higher court held that the municipality has implied powers to engage in the business of advertising, selling and installing gas appliances and equipment. This court stated important law, as follows:

"The defendant is a municipal corporation created by statute to take over, control and operate the artificial gas system of the city of Omaha, and other public utilities. . . . The grant of power to control and operate a public utility necessarily implies all the incidental powers to do anything that any business man or corporation ought to do in operating a successful business enterprise. Certainly, a private corporation engaged in the manufacture and distribution of gas may sell gas appli-

ances to the purchasing public. The sale of such appliances by private utility companies tends to increase the volume of gas sales and thereby increases the economic efficiency of the corporation. Such results are likewise necessary to the proper operation of a municipally owned business. . . . A municipality engaged in the gas business must meet the same problems. Until the district is equipped with gas appliances, there could be no gas business."

Therefore, it is quite apparent that although the state laws do not expressly authorize municipal corporations to engage in the business of selling gas appliances, yet if a municipal corporation legally acquires a gas plant, with the right to operate it for the benefit of its inhabitants, it acquires *by implication* the right to do *all* the things that a private gas company might do in order to economically and efficiently furnish gas to the citizens. Since the sale of gas-appliances is intimately connected with and incidental to the sale of gas, this right or authority of municipalities is implied. And this rule of law is applicable not only to municipalities but also to agencies or departments of a municipality authorized to sell gas. This is so because where the state legislature creates a separate municipal corporation to perform the functions of a city, such municipal agency is just as much engaged in proprietary functions as if the city was doing it itself.

As above explained, where a municipality acts strictly in its legislative, public, or governmental capacity it can neither sell gas, nor engage in the business of selling gas appliances. However, where the city has powers granted by state laws to assume proprietary duties, or engage in private business, the courts hold that the implied powers of the municipality are exactly the same as the powers acquired by a private gas corporation through similar provisions in its charter. For other higher court cases upholding this law, MacRae v. Concord, Mass., 6 N. E. (2d) 366, 108 A. L. R. 1450; Keen v. Mayor of Waycross, 101 Ga. 588; Attorney General v. Leicester, 2 Ch. Div. (Eng.) 359; 14 N. E. (2d) 392, 115 A. L. R. 1158; and Adie v. Mayor of Holyoke, 21 N. E. (2d) 377.

Authority of Public Service Commission

The Public Service Commission, as well as municipal corporations, derive its power exclusively from state laws. Moreover, this authority, while limited, is absolute so far as it extends, and a court cannot interfere with the authority or power granted a Public Service Commission by state laws.

For example, while the courts may grant injunctions against *enforcement*, of orders, rulings and regulations of Public Service Commission, yet a court cannot make gas rates, nor interfere with the administrative and legislative functions of a Public Service Commission. So held the higher court in Hayward v. State Corporation Commission, 101 Pac. (2d) 1041, reported May 31, 1940.

The facts of this case are that a citizen filed a suit and requested the court to grant an injunction to prohibit the Public Service Commission from enforcing its basic gas proration order, which was designed by the Commission to form the basis, standard, or guide to fix the allowable production for various gas wells in a certain district. The court promptly refused to grant the injunction, and said:

"It was solely the administrative function of the commission to receive and consider the evidence offered upon that hearing, and in pursuance thereof to determine the schedule of allowables. Only the commission, and not the district court or this court, has the authority and the responsibility to perform these administrative acts. The commission alone has the right and the statutory duty to promulgate, to enact, the schedule of allowables. That was a legislative function which likewise had not yet been performed and which, until performed, could not be stayed or enjoined."

Also, see Canadian River Gas Company v. Commission, 110 Fed. (2d) 350, reported April 29, 1940. In this case a Public Service Commission issued to a gas corporation its general order designating the time and place for filing schedule of rates and charges. Later the Commission ordered an investigation to determine whether any rates, charges, or classifications demanded, observed, charged, or collected, or any rules, regulations, practices, or contracts affecting such rates, charges, or classifications are unjust, unreasonable, unduly discriminatory, or preferential.

The gas corporation filed suit and asked the court to grant an injunction prohibiting the Public Service Commission from interfering with it in this manner. However, the higher court refused to do so and said:

"It is in no proper sense a definite order. Rather, it is a mere step in procedure. It neither commands nor inhibits any action on the part of the gas company."

Power of Private Corporations

As above explained, municipal corporations have all powers expressly authorized by state laws, plus such additional powers as may be implied. A Public Service Commission, also, has only such powers as are authorized by state laws, but the courts cannot vary or alter these powers, unless it actually declares the law void. Now, with respect to the powers of a private gas corporation, its charter obviously is the controlling element. On the other hand, its rights and liabilities are dependent upon the provisions of its franchise, city ordinances and contracts.

For example, in Union Light, Heat & Power Company v. City of Covington, 139 S. W. (2d) 64, reported May 21, 1940, it was disclosed that a municipality granted to a private gas company a franchise by an ordinance which specified that if the gas corporation reduced its rates in another locality, the rates to consumers in the municipality would likewise be reduced. Notwithstanding contrary contentions the higher court held that the ordinance and franchise provisions were valid. This court said:

"Had the ordinances under consideration provided that the rates to be charged should be determined by third persons or varied from time to time as conditions arose justifying variations, such provisions might be construed as delegating the rate making power. But the ordinances in question specifically designated the maximum rates to be charged. . . . To say that the city could not validly contract for a reduction of rates under specifically designated circumstances would be to deny it, not only the power conferred by the Constitution and Statute, but the power to act for the best interests of its inhabitants."

Frazer Awarded L.D. Degree

George E. Frazer, of Chicago, well known throughout the gas industry for his work as counsel for the Association of Gas Appliance and Equipment Manufacturers, has been honored with the degree of Doctor of Laws by Washburn College, of Topeka, Kansas. The presentation was made at the college's recent 75th anniversary exercises.

He served the University of Illinois two years as Professor of Public Accounting and Comptroller. His teaching has also included service as Professorial Lecturer at the University of Chicago. The States of Illinois and Ohio are indebted to him for leadership in devising their financial and governmental systems.

The Installation and Operation of Orifice Meters for Industrial Customers

By

M. J. Cereghino

Southern California Gas Company

THE FIELD of gas measurement, by means of orifice meters, has been very well standardized during the past few years. With the publication of the Gas Measurement Report No. 2 of the American Gas Association, which covered over 10 years of intensive research on orifice meter measurement, the Industry has been given a standard procedure on orifice meter measurement that definitely places this type of measurement on a sound basis.

There are several problems that still remain unsolved, the chief of which is probably, pulsating flow. However, one of the prime concerns of the orifice meter engineer today should be to endeavor to adapt his metering to the standards as recommended by the American Gas Association Report.

In line with the above recommendations, the Southern California Gas Co. accepted this procedure and on all new installations is conforming to all of its requirements.

The orifice measurement field can be divided into four groups, namely:

1. The Meter Assembly
2. Maintenance of Assembly
3. The Orifice Coefficient
4. Chart Calculations to Obtain the Gas Volume.

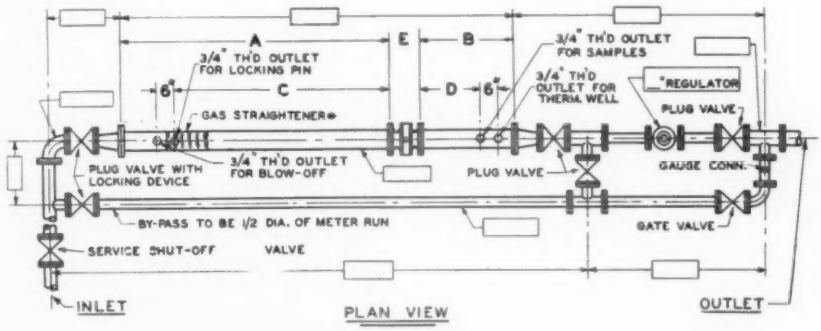
Paper to be presented at the Annual Convention of Pacific Coast Gas Association, Coronado, Calif., September 18-20.

Meter Assembly

Meter Runs

Meter runs using flange taps were adopted as standard of measurement for several reasons:

1. The meter run is much shorter than for pipe connections and thereby, easier to install.
2. Gauge piping from fitting to gauges is somewhat more convenient to connect.



PLAN VIEW

STANDARD DIMENSIONS

RUN SIZE	A	B	C	D	E (FACE-TO-FACE) COMMERCIAL DANIEL OR ROBINSON ORIFICE FITTING STANDARD	ORIFICE FITTING EX. HEAVY	JR. OR SEMI FITTING STANDARD	JR. OR SEMI FITTING EX. HEAVY
4"	7'-0"	3'-0"	4'-0"	1'-9"	9 1/2"	12"	9 1/2"	12"
6"	10'-0"	3'-6"	6'-6"	2'-3"	10 1/2"	14"	10 1/2"	14"
8"	13'-0"	4'-6"	8'-6"	3'-3"	11 1/2"	14"	11 1/2"	14"
10"	16'-0"	5'-0"	10'-3"	3'-9"	13"	15 1/2"	13"	15 1/2"
12"	19'-0"	6'-0"	12'-3"	4'-9"	14"	17"	14"	17"
16"	23'-0"	8'-0"	14'-9"	5'-9"	16"	22 1/2"	16"	22 1/2"

Figure 1

Typical Single Orifice Meter Installation with By-pass.

* FOR DETAILS OF GAS STRAIGHTENER SEE DRAWING NUMBER 446.

3. The coefficients are more constant for flange than for pipe-connected meters.
4. For equal recorded differentials, the permanent pressure loss is less with flange-connected than with pipe-connected meters.

The chief disadvantage to flange-connected meters is that the maximum capacity is about 20 per cent less than for pipe-connected meters.

Fig. 1 of this report shows a typical single meter run assembly. Both ends of the upstream and downstream meter runs are provided with welded laps and loose-ring flanges.

Orifice Fittings

Orifice fittings, either of the semi-fitting type or full fitting type, are used on all meter installations.

The use of orifice fittings greatly reduces the time and effort necessary to inspect the orifice plate.

On outside meter assemblies above the ground, the general practice is to use Junior fittings. On meter assemblies located in vaults or inside of buildings, Senior fittings are used.

Straightening Vanes

All setups are provided with straightening vanes, complying with specifications recommended by the American Gas Association.

Fig. 2 shows a detailed layout of the various sized straightening vanes from 3 to 16 inches, inclusive. The nest of tubes is made up of Shelby tubing. All of the tubes are spot welded together at both ends. A band is shrunk on each end of the completed nest of tubes and is spot welded to each of the outside groups of tubes. The straightener is held in place by means of a tapered brass locking pin, which is screwed through a coupling in the upstream end of the straightening vane.

Meter By-Pass

The by-pass, usually half of the pipe size of the meter run, is provided for in the assembly. A locking plug valve is installed in this line to insure against by-passing gas around the meter run.

Valves in Assembly

Plug valves are used on all meter assemblies, both on the meter runs and on the regulators, with the exception of the by-pass valve control valve on the regulator, which is a gate valve.

Wherever possible, the valves used are smaller than the meter runs. Flanged reducers are used to connect the valves with the meter runs. The total cost of the installation can thereby be reduced somewhat.

Gauge Mounting and Piping

Fig. 3 shows the gauge mounting and piping assembly for a typical gauge installation of an outside meter assembly.

The standard for mounting the

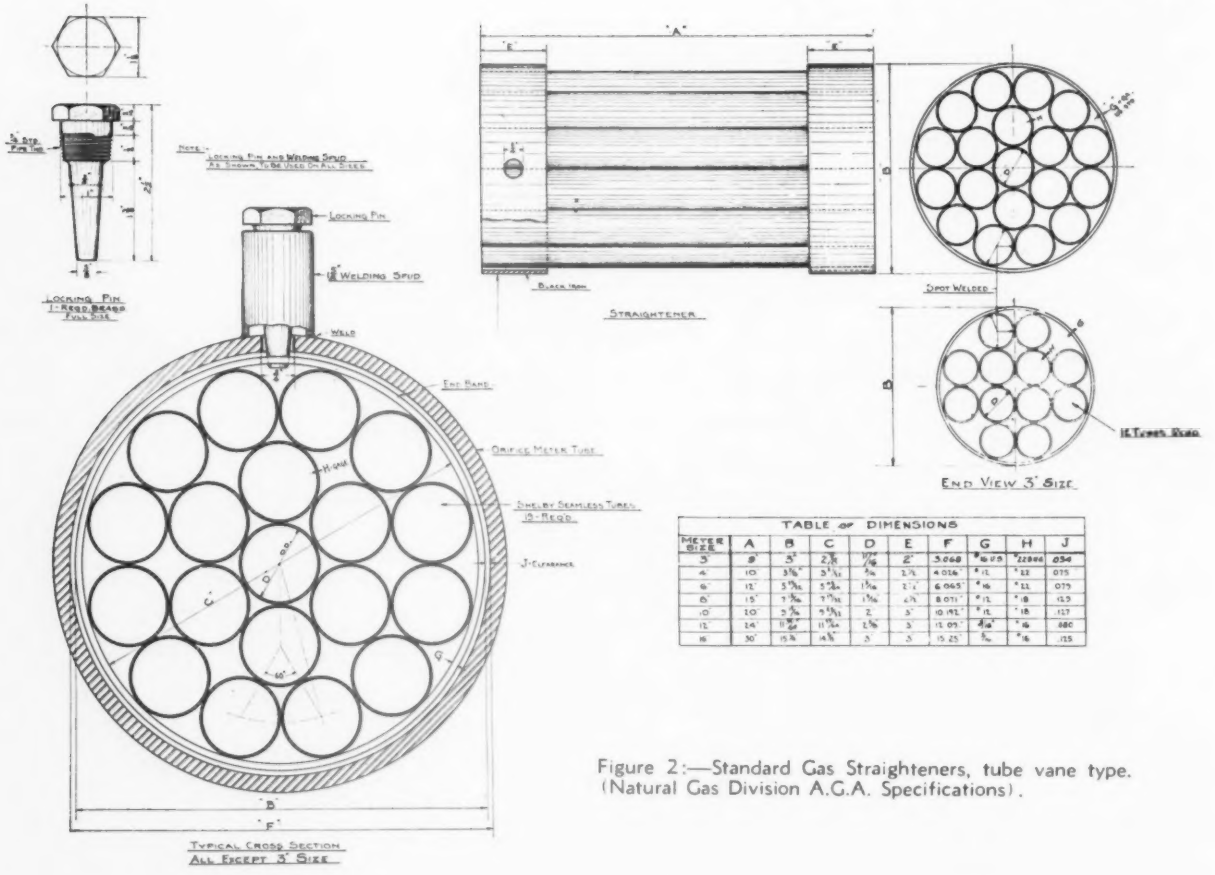


TABLE OF DIMENSIONS

METER SIZE	A	B	C	D	E	F	G	H	J
3"	8"	5"	2⅞"	1/16"	2"	3.068	#10	.22006	.034
4"	10"	3 5/16"	3 1/32"	5/32"	2⅞"	4.026	#12	#22	.075
6"	12"	5 7/32"	3 3/4"	1 5/16"	2 1/2"	6.065	#16	#22	.079
8"	15"	7 3/16"	7 7/16"	1 5/16"	4⅜"	8.071"	#12	#18	.123
10"	20"	9 3/16"	9 5/32"	2"	5"	10.192"	#12	#18	.127
12"	24"	11 5/16"	11 3/4"	2 5/16"	5"	12.09"	3/16"	#16	.080
16"	30"	15 3/16"	14 3/8"	3"	5"	15.25"	3/16"	#16	.125

Figure 2:—Standard Gas Straighteners, tube vane type. (Natural Gas Division A.G.A. Specifications).

gauge is made up of a 3-inch coupling connected to a 3 x 18-inch nipple imbedded in a concrete slab. The top of the coupling is flush with the ground level. To this coupling, a 3 x 36-inch nipple is connected which forms the support for the gauge mounting.

A reducer and 2-inch flanged union is then connected to the upper end of the 3-inch stand pipe.

The gauge is then mounted on the 2-inch union. This flanged union acts as a leveling medium to properly line up the gauge.

The gauge manifold is made up of standard ¼-inch iron nipples, ¼-inch brass union needle valves and cast steel ¼-inch fittings. The use of ¼-inch cast steel fittings over cast iron fittings is desirable in that they are less subject to sand hole leaks.

Copper tubing is used to connect the gauge manifold with the meter run taps. The use of copper tubing for this purpose has greatly reduced the amount of labor required in piping up gauges and also, has reduced the chances for leaks as there are fewer threaded connections.

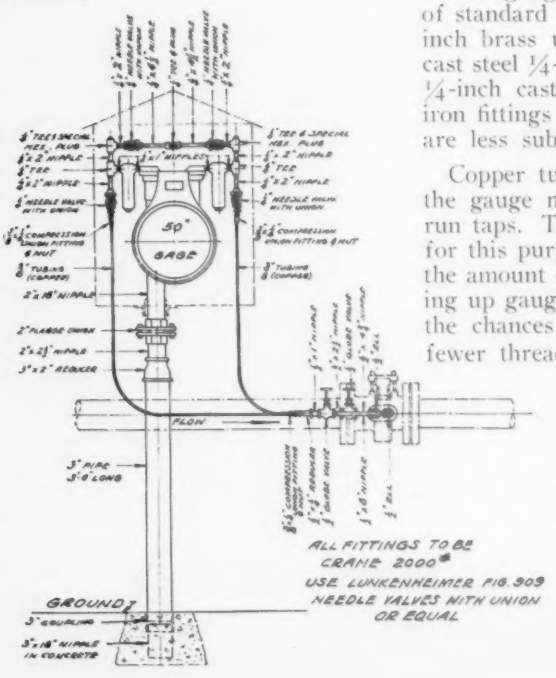


Figure 3:—Gauge piping for single orifice meter with single gauge hookup —Standard A.

Meter Run Assembly

In all installations where fittings are used, care should be taken that the fitting lines up with the upstream and also, downstream tube. Care must also be taken that gaskets do not protrude into the pipe.

In order to overcome this difficulty, especially on small sized meter runs, 3, 4, and 6-inch sizes, where it is difficult to line them up by hand, we have developed a tool known as a meter run and fitting aligner.

The tool consists essentially of two expanding jaws. The jaws are expanded by the action of a wedge which is drawn between the two jaws. An extension wrench is provided with the tool by means of which it is possible to operate this expander from a remote point.

This tool is shown in Fig. 4. It has proven very valuable in lining up fittings on the small sized meter runs. On larger sized meter runs, from 8-inch and larger, it is not as difficult to line up the meter run sections with the fitting and we have not yet been justified in building a tool for this purpose.

In case of meter runs larger than 6 inch, the accuracy of the alignment should be tested by touch through the downstream opening of the orifice fitting. The accuracy of align-

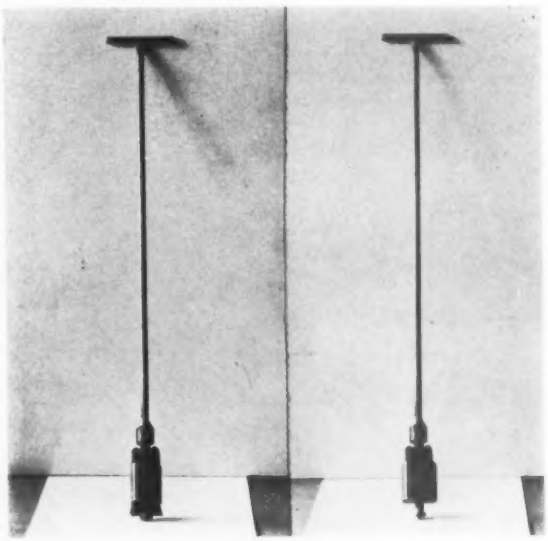


Figure 4: Tool used to line up meter run with orifice fitting. On the left, normal position; on right, tool fully expanded.

ment of the downstream section of the meter run should be tested by the measurements from the outside edge of the orifice fitting flange to the edge of the lap-welded joint on the end of the meter run section. Care should be taken to prevent gaskets from protruding into the bore of the meter run.

Fabrication of Meter Runs

Due to the difficulty encountered in the selection of pipe that would comply with the maximum out-of-roundness and also, correct internal diameter, the idea of boring meter runs from extra heavy pipe was considered.

Fig. 5 is the meter run order sheet used in ordering meter runs. It shows the various dimensions of bored and calibrated pipe, position of straightener and other taps. It also provides a space for the calibration data for the important points of the entire meter run.

The orifice meter run consists of two sections; namely, the upstream section and the downstream section.

The downstream meter run section is made of one piece of extra heavy pipe. It is provided with two loose-ring flanges and both ends of this pipe are lap-welded. The entire length of the pipe is bored as illustrated by dimension B in Fig. 5.

The upstream meter run section is made up of two sections of pipe. The section nearest to the orifice consists of a piece of extra heavy pipe, lap-welded at one end only. This section of pipe, as illustrated by dimension E in Fig. 5, extends one inch beyond the end of the straightening vane. The length of this section is such that when the straightener is inserted into the upstream meter run section, the entire distance between the orifice and the straightener is bored pipe.

The second section of pipe in the upstream meter run section is made up as a length of ordinary pipe whose internal diameter is within the tolerance allowed in the A.G.A. Specifications for meter runs. Only one end of this piece of pipe is lap-welded. The length of this section is illustrated by dimension F in Fig. 5.

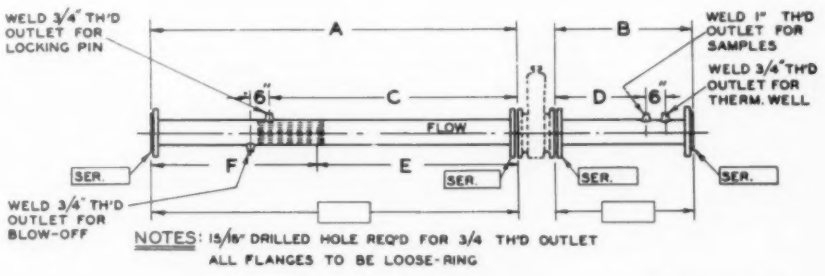
The procedure used in boring the downstream meter run section and the one section of extra heavy pipe of the upstream meter run section is as follows:

A cut is taken in a lathe on the outside circumference of each end of the section of extra heavy pipe at a point 3 or 4 inches from the end of the pipe; the purpose being to line up the outside surface and the inside surface of the pipe so that when the boring procedure takes place, a section of uniform wall thickness is produced throughout the entire section of bored pipe.

The boring is accomplished by running the boring tool through the pipe in one operation. A finished tube with a maximum out-of-roundness of about three-thousandths of an inch is obtained.

The welded joint between the section of calibrated pipe and bored pipe, forming the upstream meter run, is illustrated in Fig. 6.

The purpose of the joint is to form



FOR ONE ___ DIA. STANDARD METER RUN

METER RUN _____ (TO BE BORED) OR _____ (CALIBRATED PIPE)

OFFICE _____ DATE _____

SIGNED _____

REQUISITION NO. _____

ORDER NO. _____

CUSTOMER

ADDRESS

LOCATION

STANDARD METER RUN LENGTHS

RUN SIZE	A	B	C	D	E	F
3"	5'-0"	1'-9"	3'-3"	1'-2"	2'-8"	2'-4"
4"	7'-0"	3'-0"	4'-0"	1'-9"	3'-4"	3'-8"
6"	10'-0"	3'-8"	6'-6"	2'-3"	5'-8"	4'-4"
8"	13'-0"	4'-6"	8'-6"	3'-3"	7'-5"	5'-7"
10"	16'-0"	5'-0"	10'-3"	3'-9"	8'-9"	7'-3"
12"	19'-0"	6'-0"	12'-3"	4'-9"		
16"	23'-0"	8'-0"	14'-9"	6'-9"		

METER RUN NO. _____

CALIBRATION DATA

	INLET END UPSTREAM METER RUN SECTION			FITTING END UPSTREAM METER RUN SECTION			FITTING END DOWNSTREAM METER RUN SECTION		
	AT 1 INCH	AT DIA./2	AT DIA.	AT 1 INCH	AT DIA./2	AT DIA.	AT 1 INCH	AT DIA./2	AT DIA.
W									
X									
Y									
Z									
AVER.									
CALIBRATED SIZE									

Figure 5:—Orifice Meter Order Sheet. A.G.A. Specifications.

a welded joint which will produce a uniform section of pipe and which will leave no rough spots or irregularities on the inside bore of the pipe.

A cut is taken on the plain end of the bored section of pipe for a distance of 9/32 of an inch and to a depth so that for a 4-inch pipe, the external diameter is 4 3/16 inches.

A cut is taken on the internal section of the plain end of the calibrated section for a distance of ¼ inch. The cut is taken until the internal diameter of this section for a 4-inch pipe is slightly less than 4 3/16 inches.

When the two ends of the calibrated and bored pipe are joined together, a good tightly fitting union is then obtained with a uniform internal section.

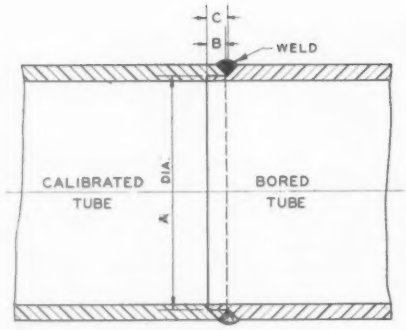
A beveled cut is taken on the end of each tube to provide a better welding surface. The two sections of pipe are then welded together.

When all of these precautions are taken, a very satisfactory meter run is produced, whose maximum out-of-roundness at every point is within three-thousandths of an inch. The inside surface is slightly on the rough side, which is an advantage in that it will thereby more nearly conform to the conditions under which the basic coefficients were calculated.

Orifice Plates

While the subject of orifice plates has no doubt been discussed many times, nevertheless, it may prove of interest to make mention of the following points:

1. Great care should be exercised in the fabrication of plates so that the upstream edge be square and sharp. Frequently the edge will be sharp but the surface of the plate near the orifice will not be flat and if the plate is closely examined, there will be many irregularities. This is true, especially, where stainless steel is used in making the plates. A dull cutting tool will also produce this effect.
2. The face of the plate should be as flat as can be obtained commercially. The maximum allowable tolerance from flatness along any diameter, should not exceed 0.01 inch per inch of pipe radius. Again, where stainless steel is used, great care should be used in boring as it is very easy to warp the plate sufficiently to exceed these tolerances.
3. Frequently, when the orifice in a plate is reamed out to a larger size and the correct size of the orifice is stamped on the plate, if care is not used in this operation, the plate may be sufficiently sprung to cause it to be dished more than the allowable tolerance. The use of an electric burning pencil for marking the size of orifice on the plate is recommended for this use.



RUN SIZE	A	B	C
3"	3 3/16"	1/4"	9/32"
4"	4 3/16"	1/4"	9/32"
6"	6 1/4"	1/4"	9/32"
8"	8 1/4"	1/4"	9/32"
10"	10 5/16"	1/4"	9/32"

Figure 6:—Detail of Welded Joint.

It is recommended that whenever plates are not in actual use, they be stored in cardboard containers or other suitable methods of protection. Careless handling of plates, when not in use, is the cause of most of our defective plate trouble.

Minimum and Maximum Capacities of Orifice Meters

The maximum capacity of an orifice meter can be definitely established. However, in determining the minimum capacity, considerable care must be taken, as at low differentials, the error in measurement, due to a slight error in the correct differential, is greatly magnified.

If the differential is mechanically off so as to cause an error of 1 per cent at the maximum range of a square root chart, the same increment at a reading of 20 per cent on the square root chart would result in an error of 5 per cent.

An error caused by an operator reading the differential too high or too low at 20 per cent of the chart range can easily cause an error of 5 per cent. However, this error is compensating and for all practical purposes, can be eliminated. The use of integrating chart calculators such as are on the market today, has aided materially in the reduction of this source of error.

An error caused from the gauge being mechanically off is more serious. This will either cause the meter to read high or low. The resultant error is not compensating. This can be eliminated to a large extent by checking the differential pen to zero when the chart is changed and by making periodic checks on the calibration of the gauge.

If this procedure is followed, it is felt that a minimum reading of 20 per cent of the rated capacity of the chart may be taken as a safe minimum reading, provided that this minimum flow does not persist for over 10 per cent of the daily flow.

Table No. 1 shows the minimum and maximum capacities of various orifice meter combinations, based on a minimum reading of 20 per cent on the square root chart.

Table No. 1. Ratio of Minimum to Maximum Capacity for Various Meter Combinations

Kind of Equipment	Ratio of Minimum to Maximum Capacity
1. Single meter run with one 50-inch gauge	1 to 5
2. Single meter run with one 10-inch gauge and one 50-inch gauge	1 to 11.2
3. Single meter run with one 10-inch gauge and one 100-inch gauge	1 to 15.8
4. Single meter run with one 2½-inch gauge and one 50-inch gauge	1 to 22.4
5. Single meter run with one 2½-inch gauge, one 50-inch gauge, and one 100-inch gauge	1 to 31.6
6. Two meter runs with one 50-inch gauge	1 to 22.6
7. Two meter runs with one 10-inch and one 50-inch gauge	1 to 50
8. Two meter runs with limit flow control, one 10-inch gauge, and two 50-inch gauges	1 to 54

Use of Orifice Meters for Industrial Customers

In deciding what type of measurement equipment should be used for industrial customers, the following conditions should be given consideration:

1. Where the variation between the minimum and maximum flow per hour is greater than 1 to 5, the use of a single meter run assembly with one 50-inch gauge is inadequate to properly measure the gas flow. The use of additional orifice meter equipment is then made necessary. The relative cost of this equipment, compared to the cost of installing a displacement meter of similar capacity, should be the determining factor in deciding which type of equipment to use.

ORIFICE METER INSPECTION RECORD—MONTHLY

SOUTHERN CALIFORNIA GAS CO.
—120—2-39—6M

NAME_____

ADDRESS_____

CITY_____ METER SIZE_____ NUMBER_____

NOTED BY	YEAR	CONDITION FOUND OF: ORIFICE PLATE/GAUGE CONN.	GAUGES	REGS./FILTERS	LEAKS	APPEARANCE	[V] INDICATES O.K. [X] INDICATES NOT O.K. REMARKS: ENTER IN MONTH INSPECTION OCCURS	SKETCH
	DATE JAN ARRV'D A.M. P.M. DEPT'D A.M. P.M. INSPECTOR	SIZE SIZE CONDITION GAUGE CONN.	SER. NO. RANGE D ZERO I F RANGE F STATIC	REGS. FILTERS		PAINT WEEDS DEBRIS		SKETCH
	DATE FEB. ARRV'D A.M. P.M. DEPT'D A.M. P.M. INSPECTOR	SIZE SIZE CONDITION GAUGE CONN.	SER. NO. RANGE D ZERO I F RANGE F STATIC	REGS. FILTERS		PAINT WEEDS DEBRIS		SKETCH
	DATE MAR ARRV'D A.M. P.M. DEPT'D A.M. P.M. INSPECTOR	SIZE SIZE CONDITION GAUGE CONN.	SER. NO. RANGE D ZERO I F RANGE F STATIC	REGS. FILTERS		PAINT WEEDS DEBRIS		SKETCH
	DATE APR. ARRV'D A.M. P.M. DEPT'D A.M. P.M. INSPECTOR	SIZE SIZE CONDITION GAUGE CONN.	SER. NO. RANGE D ZERO I F RANGE F STATIC	REGS. FILTERS		PAINT WEEDS DEBRIS		SKETCH
	DATE MAY ARRV'D A.M. P.M. DEPT'D A.M. P.M. INSPECTOR	SIZE SIZE CONDITION GAUGE CONN.	SER. NO. RANGE D ZERO I F RANGE F STATIC	REGS. FILTERS		PAINT WEEDS DEBRIS		SKETCH
	DATE JUNE ARRV'D A.M. P.M. DEPT'D A.M. P.M. INSPECTOR	SIZE SIZE CONDITION GAUGE CONN.	SER. NO. RANGE D ZERO I F RANGE F STATIC	REGS. FILTERS		PAINT WEEDS DEBRIS		SKETCH

Figure 7:—Monthly Meter Inspection Record.

2. Where the load is highly variable, and of a pulsating nature, the use of an orifice meter is not desirable. A large capacity displacement meter should be used even though the cost of measuring is higher.
3. An orifice meter is very flexible for variable demands due to the fact that by merely changing the orifice plate, the capacity of the meter can be made to vary over a wide range. However, care should be exercised so that the difference between the minimum and maximum load, is not beyond measurable limits.
4. When measuring large volumes of gas, the space factor is distinctively in favor of an orifice meter over the displacement type of meter.
5. Where cost of operation is a factor, in that an orifice meter has to be visited daily, the use of displacement type of meter is preferable, provided that the visits to the installation can be reduced to 7-day periods. However, if the demands are such that a daily reading is demanded, the use of an orifice meter in most cases is preferable, where the demand is equivalent to the capacity of two large displacement meters.
6. The orifice meter, if constructed and operated according to A.G.A. Standards, has a distinct advantage in that its accuracy can be readily checked in a much shorter period of time and at a smaller expense than the displacement type of meter.
7. Where gas is measured under pressure, the results are more accurate when using an orifice meter, unless integrating equipment is used in conjunction with the displacement type of meter.

Maintenance of Meter Assembly

The maintenance of an orifice meter assembly is a matter of prime importance in order to obtain accurate measurement.

Our general plan is to make a monthly inspection of the meter assembly. This inspection includes the following routine:

Orifice Plate

Remove orifice plate from fitting and examine for dirt, orifice edge, and size of orifice. If the plate is dirty, it should be carefully cleaned. A close examination should be made of the orifice edge and if it does not comply with standard specifications, it should be replaced.

Plate should also be inspected to see that the size of orifice as stamped on the plate is the same as is being used in the coefficient.

Orifice Meter Gauge

Check the differential to zero. Note the operation of pen arm to see that pen travels freely and at the same time, check arc on chart, and check stuffing box for leaks.

The differential is checked to zero daily by Chart Collector as a routine procedure, after he has put on the new chart.

Check the static element with standard test gauge and reset pen arm, if necessary. Periodically, the orifice gauge should be calibrated throughout its range with a water manometer. The frequency of this calibration will depend upon the importance of the meter and likewise, on its visual performance.

Where a meter is measuring large volumes of gas, it may be found desirable to make monthly calibrations. On other meters, the frequency of calibration may be increased to once every six months.

Accessory Equipment

A visual inspection should be

made of the performance of regulators, operating in conjunction with the meter assembly. Likewise, the condition of the dust trap, if the meter assembly is provided with one.

In the case of the dust trap, a check should be made of the drop in pressure across the filtering medium.

Leaks

At regular intervals, a check should be made of leaks around the gauge piping and all joints that make up the meter assembly. This item is important, when a meter is located on a customer's premises, where the existence of a leak may cause damage due to gas igniting.

General Inspection

A general inspection of the meter assembly should be made monthly, noting the general appearance of the painted surfaces, and also, whether or not weeds or debris are cluttered around the meter assembly. A neat appearing meter assembly creates a good impression on the customer.

Fig. 7 is the orifice meter inspection record and used to record results of monthly meter inspections.

By means of this form, an inspector is able to have before him a complete picture of the monthly inspections for any particular meter assembly for an entire year.

Space is provided for recording all of the preceding inspections and in addition, a space is provided after each month's inspection for added remarks.

This form has been in use for about two years and has proven to be a very valuable record in checking the operations of any particular meter assembly over a period of time, as all of the information desired is noted on this one report.

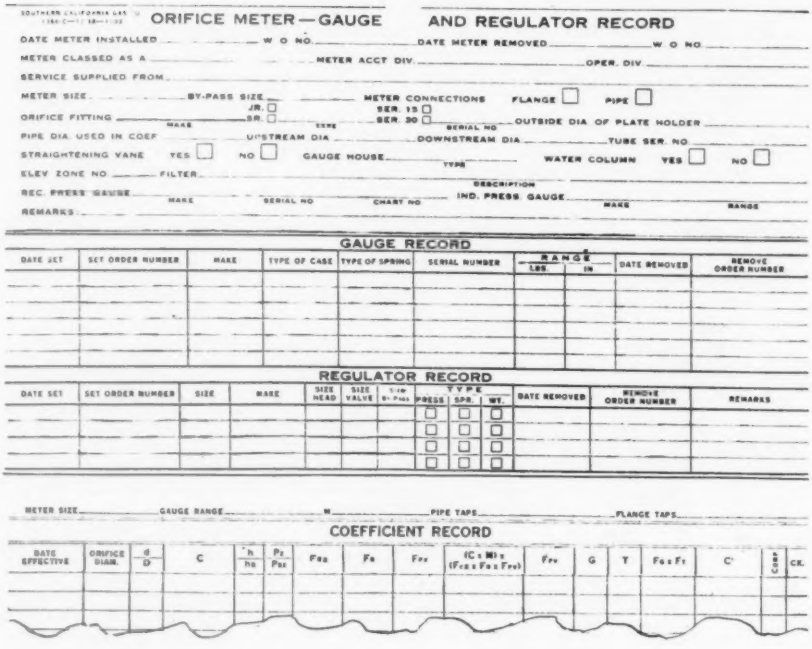
In addition to this orifice meter inspection record, another form known as the orifice meter gauge and regulator record, shown in Fig. 8, is also maintained.

The purpose of this card is to maintain an office record of all of the measuring and regulating equipment at each meter location.

The record contains a full description of the meter run assembly, type of fitting, recording gauge equipment, regulator and dust trap equipment.

A detailed record is kept of the orifice meter gauges, pressure gauges, and regulating equipment used.

The advantage of this record is that in case of any question pertaining to the operation, capacity, or other information, that may be desired relative to any meter assembly, a glance at this form will immediately give a complete picture of the nature of equipment that is in use at this particular location.


ORIFICE METER—GAUGE AND REGULATOR RECORD

DATE METER INSTALLED ____ W O NO. ____ DATE METER REMOVED ____ W O NO. ____

METER CLASSED AS A ____ METER ACCT DIV. ____ OPER. DIV. ____

SERVICE SUPPLIED FROM ____

METER SIZE ____ BY-PASS SIZE ____ METER CONNECTIONS FLANGE ☐ PIPE ☐

ORIFICE FITTING ____ MAKE ____ JR. ☐ SR. ☐ SERIES ____ SER. 15 ☐ SER. 30 ☐ SERIAL NO. ____ OUTSIDE DIA. OF PLATE HOLDER ____

PIPE DIA. USED IN COEF. ____ UPSTREAM DIA. ____ DOWNSTREAM DIA. ____ TUBE SER. NO. ____

STRAIGHTENING VANE YES ☐ NO ☐ GAUGE HOUSE ____ TYPE ____ WATER COLUMN YES ☐ NO ☐

ELEV. ZONE NO. ____ FILTER ____ DESCRIPTION ____

REC. PRESS. GAUGE ____ MAKE ____ SERIAL NO. ____ CHART NO. ____ IND. PRESS. GAUGE ____ MAKE ____ RANGE ____

REMARKS ____

GAUGE RECORD

DATE SET	SET ORDER NUMBER	MAKE	TYPE OF CASE	TYPE OF SPRING	SERIAL NUMBER	RANGE LBS.	RANGE IN	DATE REMOVED	REMOVE ORDER NUMBER

REGULATOR RECORD

DATE SET	SET ORDER NUMBER	SIZE	MAKE	SIZE HEAD	SIZE VALVE	S.W. O. Pres	TYPE PRESS	TYPE SPR.	TYPE WT.	DATE REMOVED	REMOVE ORDER NUMBER	REMARKS
							☐	☐	☐			
							☐	☐	☐			
							☐	☐	☐			

METER SIZE ____ GAUGE RANGE ____ W ____ PIPE TAPS ____ FLANGE TAPS ____

COEFFICIENT RECORD

DATE EFFECTIVE	ORIFICE DIAM.	d/D	C	h/hs	Pf/Psx	Fgs	Fa	Fpv	(C x M) x (Fgs x Fa x Fpv)	Fpv	G	Y	Fa x Fr	C'	CORR	CK.

Figures 8 and 9:—Gauge and Regulator Record and Coefficient Record.

The Orifice Coefficient

The report of the joint committee of the C.N.G.A., S.C.M.A. and the P.C.G.A., covered in a handbook to be issued on a uniform method of calculations of coefficients will, no doubt, go a long way towards settling our problems, with calculations of coefficients. Therefore, little mention will be made in this report on this subject.

The following, briefly stated, is the general method used in calculation of orifice meter coefficients, as practiced in the Central Division of the Southern California Gas Co.:

1. Coefficient changes are made on a monthly basis.

2. The data on Specific Gravity, Temperature, and Static Pressure for the previous month are used for the current month.

3. A revised coefficient, as shown in Fig. 9, is set up for each meter which consists of:

$$C \times M \times Fe_2 \times F_R \times F_{pv}$$

This revised coefficient is then multiplied by the specific gravity and temperature factor and the corrected gas coefficient is easily calculated.

4. The M Factor, when square root charts are used, is multiplied by the standard coefficient, C.

5. The Expansion Factor, Fe_2, is set up and changed only with a plate change.

6. The Reynold's Number Factor, F_R is set up and changed only with a plate change.

7. The Super-Expansibility Factor, F_{pv}, is set up and under normal conditions is changed only with a plate change. However, where the static pressure is apt to fluctuate violently, this factor is not included in the revised coefficient.

Ordinarily, the only factors that are changed monthly are the Fg and F_T Factors.

(Revised Coefficient) $(Fg \times F_T)$ = Corrected Gas Coefficient.

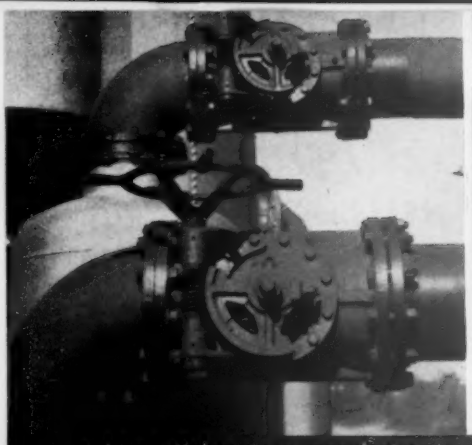
Results of several years' experience with the use of the new coefficients and factors as published in Report No. 2 of the American Gas Association on Gas Measurement, have led us to the conclusion that the method of calculating coefficients, as above stated, will give a coefficient that will be well within the accuracy expectancy of commercial gas measurement.

(*Continued on page 46*)

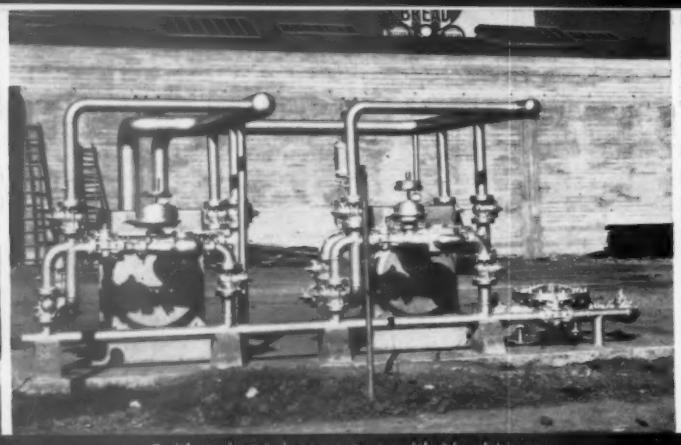
15,000 POUNDS' TEST PRESSURE

Fifteen years ago not even a Prophet would voice the suggestion of 15,000-lb. test pressures for valves. 3000-lb. tests then were the usual limit—and Nordstrom Lubricated Valves were available for this test. A few years later 6000-lb. test valves were needed—and *Nordstrom produced them.* Only two years ago 10,000-lb. test valves were demanded, principally for oil field drilling and production. Nordstrom, anticipating the need, met it immediately. Today, hundreds of these high pressure valves *(Hypreseal Type)* are in service, meeting a need no other type of valve can equal. And now comes a new giant of strength—the Nordstrom 15,000-lb. test valve, developed principally for recycling service in gas and oil fields, but available, if necessary, for any other excessive pressure service. Naturally, it's made of special alloy steel, with both plug and interior contact surfaces faced with Merchrome, the latest development in hard-facing.

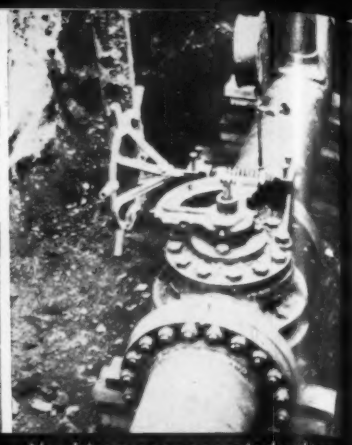
It's a Nordstrom



Nordstrom Valves in a manufactured gas plant on Long Island, New York.



Calif. industrial gas set-up with Nordstrom valves, EMCO meters and EMCO regulators.



Nordstrom gear-operated valves on gas pipe line in Mississippi.

KEEP UPKEEP DOWN
—the Nordstrom way

FOR ALL GAS SERVICES

Unaccounted-for gas is greatly reduced by the use of Nordstroms. The hazard of leaks is eliminated. No matter how infrequently a Nordstrom is operated it will always close or open instantly. They are as essential on low pressure city service lines as for main transmission lines. In combination with EMCO Meters and EMCO Regulators, they make the ideal set-up. On feeder lines, in control pits, on industrial burner lines, Nordstroms are the safest installation. Nothing will serve like a Nordstrom.

THESE ADVANTAGES SPELL ECONOMY

QUARTER TURN
Quickest to operate; easiest to see valve position.

SIMPLEST DESIGN
Fewest parts. Nothing to clog or trap line contents.

NO BLOW-OUTS
No channeling. Internal leakage precluded.

"SEALDPORT" LUBRICATION
Plug lifts by positive pressure. Ports always sealed.

FULL FLOATING PLUGS
Always easy to turn. Non-freezing. Non-seizing.

LAPPED PLUGS
Lapped by exclusive processes for precision fit.

NO EXPOSED SEAT
Plug rides on sealed pressure lubricant seat.

NON-STICKING
Powerful hydraulic action lifts and frees plug.

COMPACT
No protruding stems or yokes. Occupy least space.

CHECK VALVES
Two or more positive-acting checks in shanks.

SPECIAL LUBRICANTS
Highly developed plastic lubricants for all services.

Nordstrom
LUBRICATED VALVES

Sealdport Lubrication

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New Meter Repair Equipment

By
Henry S .Harris
Southern California Gas Company

THIS PAPER describes some new methods and equipment used in the meter shops of the Southern California Gas Co. It is published with the hope that some of the devices illustrated will be of interest to meter repairmen in other shops. In most cases the illustrations are self explanatory.

Topping Tin Meters

The conventional method of topping tin meters is to use a wood block or other support to set meter at an angle whereby the solder will flow into the V-shaped crevice thus formed.

Fig. 1 shows a topping machine built for this purpose. The meter is placed on a revolving table, which is revolved in 90 degree increments through a lift that is powered by an air piston. Along the floor will be noted a long foot pedal, so constructed that the operator may revolve the table without his having to be in any set position.

Stripping Tin Meters

Fig. 2 shows a peculiar wedge-shaped soldering copper for removing old style back plates from tin meters. It may be seen that with such a soldering copper the inside corners of the meter are made readily accessible.

Painting Domestic Meters

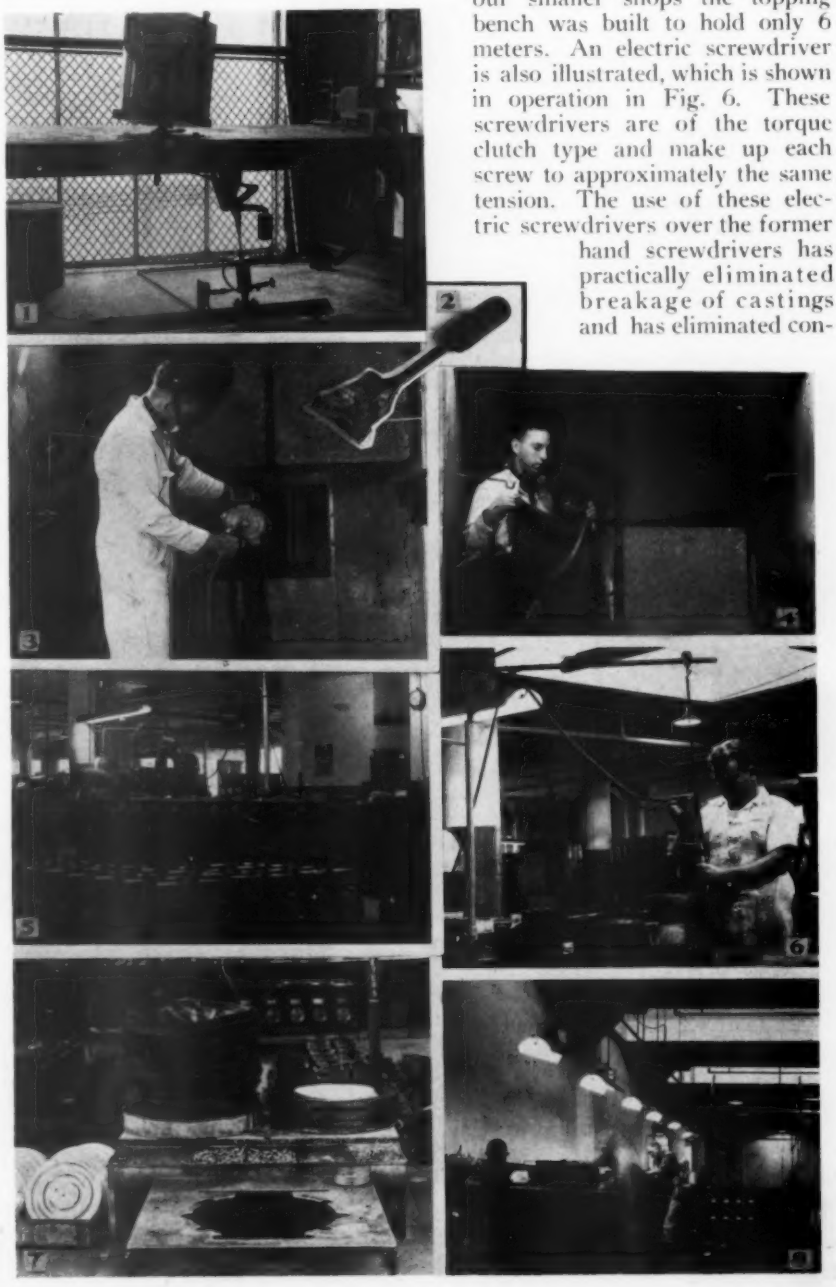
In the conventional method of painting meters with the aid of a spray gun the meter is placed on its back with a guard over the index glass. After painting as much as possible of the meter in this position it is placed upright, and the painting job completed. In such an operation, it is obvious that to remove the index glass guard and place the meter in an upright position, the operator must hang up his spray gun. Fig. 3 shows a method of painting the meter in one operation. The guard shown over the index glass is held in place with a rubber suction cup. The operator can then tip the meter with one hand while he paints the bottom of the meter, then permit the meter to return to an upright position and continue painting.

Paper to be presented at the Annual Meeting, Pacific Coast Gas Association, Coronado, Calif., Sept. 18-20.

In connection with painting meters, we have found that considerable time may be saved by the use of "Boothmask" in place of the customary greased paper. Boothmask is advisable only when sufficient painting is done to build up a paint film thick enough to prevent the drying of the Boothmask. Fig. 4 shows a heavy film of paint removed from the Boothmask.

Bench Equipment

Fig. 5 illustrates a bench for topping Sprague meters designed to hold the meters at a convenient working height. This bench will accommodate 12 meters. In one of our smaller shops the topping bench was built to hold only 6 meters. An electric screwdriver is also illustrated, which is shown in operation in Fig. 6. These screwdrivers are of the torque clutch type and make up each screw to approximately the same tension. The use of these electric screwdrivers over the former hand screwdrivers has practically eliminated breakage of castings and has eliminated con-



siderable flange leakage at the submersion test. The operator in this illustration is performing the task of diaphragming and casing-in the Sprague meter. In Fig. 7 may be seen a similar bench and equipment. In the foreground will be noted a steel jig to hold the meter, which we find more satisfactory than the former wooden holders. Directly in back is a sheet metal bin for stocking the various sized screws and diaphragm nuts used in the assembly. The small round cup in the foreground contains the diaphragm pins. In the background and to the right is a container for diaphragm and flange gaskets, and to the left diaphragms in a container to catch any oil which may drain from the diaphragms. To the extreme left can be seen a container for diaphragm tins or discs.

Fig. 8 shows benches for the removal and installation of Sprague main movements. If the reader will compare this illustration with Figs. 5 and 6, he will note the different heights of the benches, which are so constructed as to accommodate the work being performed. Directly above the benches are the new type fluorescent lights, which give some 10 times the illumination formerly given by mazda lamps. Because they radiate virtually no heat these lamps may be installed directly over the head of the operator.

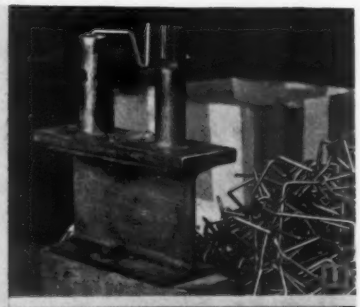
Jigs for Repairing Sprague Meters

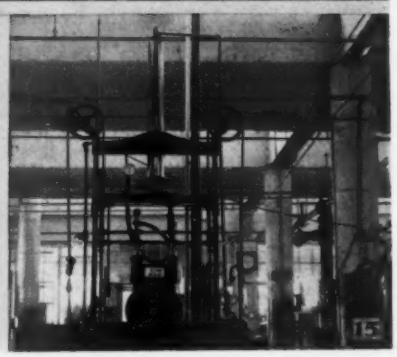
Figs. 9, 10, 11 and 12 depict various jigs used for the repairing of Sprague meters. While additional jigs are used, those shown are some developed in our shop by Mr. H. A. Gregory, meter inspector, and are described here because they are not in common use. Fig. 9 shows a gauge to leave the center post of the main movement at its proper height. With reference to the conventional method of installing main movements, one may probably minimize the importance of this jig. In our method of installation instead of threading the main movement into the center casting until the center post reaches the proper height we run the main movement in to a definite distance in order to center the main movement and the excess center post is then cut off. The jig used for this purpose simulates the height of the valve seat, thus leaving the post at the correct position. One end of the jig is for No. 1A Sprague meters, and the other No. 1 meters. Please observe that at the point at which the operator grips the jig, considerable height is given to the tool so that in the event the hacksaw slips it will not injure the operator's hand.

Fig. 10 is a jig which has a twofold purpose. The back part of the jig, which cannot be seen in the illustration, is up against the flanged portion of the crank and lines up through that part of the crank which holds the volume adjustment, to determine if the angle of the crank is correct. In addition to that which may be seen in the illustration there is a stop against the volume adjustment button, and in the assembly of the meter the adjustment button is run out to that point so that the prover operator will receive all meters with the volume adjustment in the same relative position.

Fig. 11 shows a jig for lining up the diaphragm carrier wires. As you look at the illustration the post on the left represents the side carrier bracket while the post on the right represents the position in which the wire should pass through the meter at that particular point. When the wire is pushed into the jig the correct height is determined by the small shelf shown. The correct length of the wire is determined by its falling into the impression shown, also it is assured that both ends of the wire are perpendicular to each other. In the lefthand post will be noted a hole through the post. This is in the event small particles scrape off the wire when inserted into the jig so they may deposit in the hole and then be removed.

Fig. 12 shows a height gauge, which takes the guess work out of the assembly when matching the top of the valve cover to the index driving movement flag. In most shops, it is customary to hold the top on the meter and





shake the meter in order to determine the clearance. In the position shown by the illustration the jig is determining the valve cover height after having been inserted upside down in the cover of the meter to determine the position of the flag. If the valve cover is found to be too low or too high the situation is remedied by using a valve cover of a different height. If very much too low two top gaskets are employed.

Provers

In order to avoid as much eye strain as possible as well as to aid in the elimination of errors we have installed so-called fine readers on nearly all our provers, as shown in Fig. 13. This instrument is an adaptation of one suggested by the American Meter Co., and magnifies the prover scale approximately 4-to-1. It eliminates the necessity of the operator leveling his eye in line with the prover scale and the pointer.

Fig. 14 shows one of the new posture chairs recently put in use for prover operators. In general, where prover operators are permitted to be seated when proving meters they use stools, boxes or some makeshift chairs. The tendency in this type of work is to slouch over on to the bench, and this type posture chair is found to be a considerable improvement. In conjunction with the use of the fine readers practically the entire proving work can be performed in a sitting position.

Submersion Test Equipment

In Fig. 15 is shown an old type hydro-pneumatic meter testing tank. This tank has been converted from manual operation to air pressure operation merely by installing the piston, as shown, releasing the lock catches on the shafts and increasing the counter weights. We have had three of these in operation for approximately three years and have found them to be very satisfactory.

Low Temperature Insulation Hints

By

W. F. Schaphorst, M.E.

Newark, N. J.

Not long ago an engineer wrote that he was having considerable trouble due to condensation on one of his cold water lines. He stated that the pipes have been covered twice within two years with an anti-sweat covering made of wool felt. The felt was rotting and had to be replaced. The temperature in the room was about 75 deg. F. The pipe carried city water which he called "quite cool."

It is common practice for cold lines to be insulated with either ice water thickness cork pipe covering, or one of the many grades of felt used for this purpose. Tar lined wool felt is most frequently used, although there is considerable use of wool felt just wrapped around the pipe, and also of air cell covering made up of a type of corrugated paper. These are the cheapest commercial insulations. High grade cork covering is generally used where one wants a good lasting job. Cork usually costs more in the first place than any of the various felt types.

Before proceeding further it might be well to point out that there is a sharp line of demarcation between sweating and frosting. Sweating can occur where the pipe temperatures are as high as 50 or 60 deg. F. Sometimes the temperature is even higher depending upon the humidity and temperature conditions in the room. It is ordinarily manifest upon lines from 40 to 50 degrees, under, what might be termed, normal conditions. For this type of work the cheaper insulations are usually sufficient. When the temperature of the line is that of "ice water," as, say temperatures below 40 and above 35, the line will almost invariably sweat, and it is here that cork finds its most usual application. Cork does not rot or warp. It does not move over to one side like felt and some of the cheaper insulating materials. When properly installed it does not even become moist. Regardless of the temperature of the cold pipe, whether it is 100 deg. F. below zero or even lower, and regardless of the room temperature, whether it is 75 deg. F. or higher and regardless of the humidity in the room, when properly insulated with high grade cork there will be no sweating or frosting on the line. Of course, where the temperature is exceedingly low commercial thicknesses are not sufficient. Special insulation must then be designed. In fact, special insulation must be designed for all temperatures below minus 10 deg. F.

This writer finds that impossible claims are sometimes made with regard to cold insulation. Thus for example, I have before me a declaration by a prominent concern in which they say that they build 100% insulation in their product. Such a statement, of course, is ambiguous. It is obvious that if 100% insulation is built into anything it will be all insulation and there will be no room left for anything else. Thus, for instance, if you were to build a cold storage room 100′ x 100′ x 20′ and would then attempt to build 100% insulation into it, it would be necessary to fill the entire room with insulating material. Or, on a cold pipe line, the thickness would never stop. There is no insulation known to man which saves *all* of the heat, or *all* of the cold, as the case may be.

SUPERIOR GAS METERS

For Sound Values and Continuous Operating Economy

Meters for Domestic and Industrial Use. All Sizes 5B to 60C.
Wet Test and Demonstration Meters — Diaphragms —
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Gas consumption enough to interest you —low enough to attract buyers.

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Cabinet is 10" wide, 17" deep, 35½" high. Neat gray crackle finish. 55 lbs., 3" vent, ⅜" gas line, 3/16" water tube.

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MONMOUTH

The Greatest Name in Humidification

The Selling Parade

A Digest of Successful Selling Ideas

By
Charles B. Roth

IT WAS the tail end of August and I was late in getting my vacation out of the way. Press of work, one thing and another, you know. When I did get to the resort town where I usually go, I practically had it to myself.

I hadn't bought any equipage in town before I left: I recollected the smart and enterprising little man who operated the general store and was always well stocked with everything a fisherman, a bather, a canoeist, a tenter might need. So I went light.

The morning after I arrived I made a list of things I needed, and went down to the store to pick them out.

There were eleven items on the list. The merchant was out of nine of them.

"How come, Henry?" I asked. "Why don't you have these things?"

"Oh, I always let my stocks get short this time of the year. You know that."

"I know. But you let 'em get too short this year, didn't you?"

"I've been out of some of those things since July."

"And didn't re-order?"

"No."

"Didn't any jobber's salesmen try to sell you some of those short items, so as to help you take advantage of late-season vacationers?"

"Nary one," said Henry. "In fact, they haven't been calling on me since May."

You write your own moral to this. Somewhere in this experience of mine with short stocks is an idea which some enterprising salesman will use in convincing his customers that whenever they run short stocks they lose money. He can cash in on that idea to the tune of thousands of dollars worth of business every year.

THE present vast Ford business owes much of its size and success to a "salesman who was too dumb to be afraid." This startling

statement was made by the late Norval Hawkins, first Ford salesman ager, just before his death som months ago.

"If it hadn't been for this dumb salesman in South Dakota," said he, "the motor industry might never have reached its present size."

Mr. Hawkins liked to muse on this subject, and this is the story he told around it:

"In the early days people didn't drive their cars in the winter. They put them up on jacks. Consequently dealers made no car sales. They just about shut up shop.

"But one small dealer in cold South Dakota kept sending in orders right through the winter months. It made me vexed to see anybody flou tradition so, and I called him in.

"He was a big, awkward, gangling farmer-like youngster. I was harsh with him. He apologized, and said he didn't know we were supposed to stop selling cars in the winter time. He was too dumb to be afraid of tradition."

This gave Hawkins an idea. He lashed his dealer organization furiously to keep after winter sales. People began driving their cars all winter. Now January is one of the peak motor months—because of a "salesman who was too dumb to be afraid."

THERE are not "impossible customers but there are many fainthearted salesman," an old veteran in the selling game told me last night.

Like most men whose manes have turned to silver, he holds the younger generation of salesmen in contempt. Maybe that's what age does to a man. Although I didn't agree with him when he said we were a soft generation, I enjoyed his theory of there being no impossible customers.

"When a salesman makes up his mind he can't sell a man," he told me, "the salesman's doomed. I never met a man I didn't think I could sell."

"But you surely didn't sell them all," I observed.

"Not all of them. I don't yet. But it wasn't because I decided that beforehand. I always let the customer decide he wasn't going to buy. I never helped him by deciding that for him. Get my point?"

"Very well," said I and added: "I believe you have put your finger on one of the most important lessons in salesmanship."

ONE selling story I never tire of hearing is about how Joseph Day, New York real estate genius, sold the old Empire Building to the late Judge Elbert Gary, steel corporation head.

The steel company needed new quarters. It had been a renter in the Empire for years—in fact, ever since it started. Mr. Day believed in his heart that the corporation could do no better than to buy the building.

He talked frequently about it to Judge Gary, but Gary's associates wanted a newer, a fancier, a swankier building. Gary thought he sided with them.

One afternoon Joseph Day asked Judge Gary: "Where did you form the Steel Corporation, Judge?"

"In this very building."

"Then it's your home, isn't it? The only business home you have ever had?" remarked the salesman.

"Yes," replied the Judge. Then suddenly: "Some of my associates want to put us into a newer building. But here is where we started,

and here is where we belong. Mr. Day, draw up the papers for the purchase of this building."

What had the salesman done? Nothing much, except give the customer a chance to sell himself, which is always good salesmanship, because once a man sells himself he is rarely dissatisfied later with the sale.

WHEN the buyer says "No," it doesn't necessarily mean "No." It may mean "Yes," or "I am not so sure," or "Go ahead and see if you can sell me."

Good salesmen never take no for an answer, and the sure sign of a tyro is that he gives up with the buyer's first refusal to buy.

Many buyers say "No," because that is a defense against most salesmen. They tell it to all the men who call upon them. But if you will keep after them, really follow them close, the chances are you can transform the "No," to a "Yes." Selling holds few delights comparable to the satisfaction of doing that.

AROUND one business they still speak in awe and hushed tones when they discuss the record a friend of mine made with that firm, although it happened many years ago. A depression had struck the country when he was advertising manager of the concern, and the sales force was whipped. The president told my friend to get out and sell.

He went out. And sold. Orders came pouring into the factory. This heartened the other salesmen, so

that they went out and sold. Actually the leadership of this one man pulled the firm out of the mire. It is now the leader in its industry.

I like to hear my friend tell how he did this impossible job, because it always gives me a lift when he does, and also an insight into the principles a real salesman follows when he goes out to sell.

"We needed sales," said he, "we needed sales badly, right now. It wasn't any time for soft-hearted salesmanship. The times required closed contracts today. So I worked out a presentation which would make one-call sales. Which would sell 'em fast.

"I told every prospect the same thing: 'I am an executive in this firm, and will be in town only twenty-four hours. I am prepared to give you a special offer.' Then I would tell them what the special offer was. It wasn't so very special, but my insistence that I would be in town only twenty-four hours made it look like business that had to be done right now. And we did business right now.

"I think a good many salesmen let the buyer take the sale out of their hands, because they are afraid to try for a close on the spot. If your product or proposition is good for the buyer, why isn't it as good for him today as it will be next week, when he gets around to making up his own mind to buy?"

"Stop and Go"—*the Trouble Maker*

banished by Republic Gradient-Heet

Most of your troubles in gas heating can be traced to "Stop and Go" heating.

Gradient-Heet—now standard equipment on the Republic Conversion Burner—gives you continuous heating by grading the gas input to suit the room temperature.

AUTOGAS COMPANY

2240 Diversey **Chicago, Ill.**

THE RANGE DETERMINES THE TRUE MODERNITY OF AS A COOKING

UNIVERSAL

GUARANTEES A NEW AND HIGHER STANDARD OF COOKING PERFORMANCE!

The Universal Gas Range with its advanced devices promotes the best interests of the gas utility company because it emphasizes the natural advantages of gas as the one best cooking fuel. Universal gives superior controllability of all cooking heats—placing at the command of the homemaker all methods and processes of cookery. It brings to the consumer a new conception as to the inherent merit of gas fuel—its outstanding economy, convenience and flexibility. Universal is the instrument that proves the statement —"Gas Is The Ideal Fuel For All Cooking Purposes."

GAS OR GASOLINE

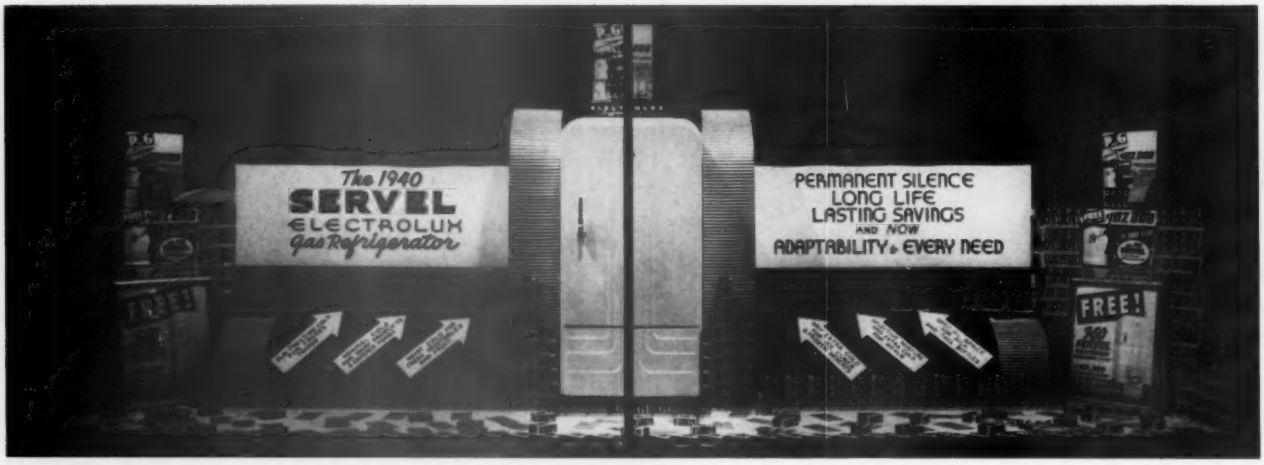
★

It is the vehicle through which it is used that in the final analysis enables the fuel to render the utmost in service. Modern motor fuel utilized in a 1920 vintage automobile cannot possibly give the consumer a true understanding of its remarkable performance capabilities. It is also a fact that gas fuel utilized through an obsolete range creates an entirely false impression as to the true modernity of gas as a cooking fuel. With gasoline it is the car—with gas fuel it is the range that determines the type and degree of service performance rendered.

★

UNIVERSAL *Gas Ranges*

MANUFACTURED BY CRIBBEN & SEXTON CO. • 700 N. SACRAMENTO BLVD. • CHICAGO



Providing Window Space for Local Users of Gas

Makes Friends and Boosts Good Will

By

Fred E. Kunkel

Walk by the window of the Arkansas Louisiana Gas Company in Little Rock, Ark., at any time and you will always find an attractive window display, seven by twenty feet, used by manufacturers of local products in which gas heat has either directly or indirectly played a part in the production of those products.

This is a free service and local merchants, distributors, and manufacturers are always clamoring for it, so that the company has a waiting list. It is a cooperative merchandising plan and a good will builder, which makes life long friends.

It is being used by local meat packing plants, featuring locally smoked meats stored during the winter; a coffee roasting company where gas is used; coca cola, snowdrift flour, salt, mostly local outfits; locally made candles, wrought iron products, etc.

"All we do is give them the display window," explained C. B. Wilson. "They create the display themselves. We do not hire any one to put it in for them.

"This undoubtedly influences business and they have shown their appreciation in any number of ways for giving them the display.

"Recently we tied in with Electrolux, giving Procter & Gamble this window, because they were giving away an Electrolux every day. We also published the current P & G radio program and also took a radio spot announcement, following the Guiding Light program each day, a Servel radio program during which gas refrigerators are given away as prizes, telling the public this is the place to buy their Servel Electrolux refrigerator.

"We started the idea sometime ago when we ran a window by one of the gas appliance manufacturers and a local man said, 'How about my having a window to feature a Little Rock product?' That started us but we have had to restrict it to local manufactured products, because those out of the state would want it. And we have to be careful because local people might become offended. It is free advertising space and we give it to them from a week to a month. It is something different and people will stop and look at it."

VISIT OUR NEW BAR AND TERRACE

HOTEL CHELSEA

AS FRIENDLY AS YOUR HOME—OFFERS DIVERSION FOR EVERY MEMBER OF THE FAMILY

Concerts and dinner music by artists of Phila. Orchestra • Luncheon served guests in bathing attire on open air dining terrace • Restricted beach • Bathing from rooms • Dancing • Bar • Sundecks • Social Director • Kindergartner • Noted cuisine.

RATES FOR ROOM, BATH & MEALS $6.50 (Per Person, Two in a Room) FROM DAILY
ALSO EUROPEAN PLAN — Proportionately Less

ATLANTIC CITY

JOEL HILLMAN • J. CHRISTIAN MYERS • JULIAN A. HILLMAN

In Cleveland—It's The
COLONIAL HOTEL
"Cleveland's Small Hotel in the Midst of the Large Hotels"
Thru the Colonial Arcade from Euclid and E. 6th
Large, Clean, Well Furnished, Comfortable Rooms at $1.50 Single and Upwards.

You'll Enjoy Our
DELIGHTFUL GRILL BAR

Randall M. (Duffy) Lewis, Mgr.

Torrent or trickle,

...as easily as turning your kitchen faucet!

THE SECRET ? CONTROL

Impounded water exerts a tremendous force that, once unleashed, seemingly cannot be restrained. Yet the mere flick of a switch can do the trick, thanks to modern floodgate *control* mechanism.

In top burner cooking, efficient results depend on a wide and accurate range of heat *control*. So superior in this respect is the Harper Burner System that it has become standard equipment on better gas ranges. Every day it is helping the gas industry to more firmly convince women that *gas* has no equal for cooking.

Norman Reaves

...or. 1940, Harper-Wyman Co.

CONTROL *is the secret here, too*

● The Harper Burner System is a patented invention whereby each of the burners on the range is actually 2 burners in 1 . . . a burner within a burner . . . both operated and controlled by a single handle.

This arrangement affords a high-speed STARTING BURNER to *start* foods boiling and for fast frying . . . plus a small, central, economical COOKING BURNER for *maintaining* the cooking. The COOKING BURNER can be used entirely independently of the STARTING BURNER. No other top burner possesses this vital advantage — which insures easy, accurate control: just the right heat for every type of top burner cooking . . . every time.

HARPER-WYMAN COMPANY
8562 Vincennes Avenue, Chicago, Ill.

HARPER BURNER SYSTEM

HARPER BURNER SYSTEM

Demonstrates GAS at its best

SEE OTHER SIDE OF THIS PAGE

For boiling drinking water . . .

The HARPER BURNER SYSTEM

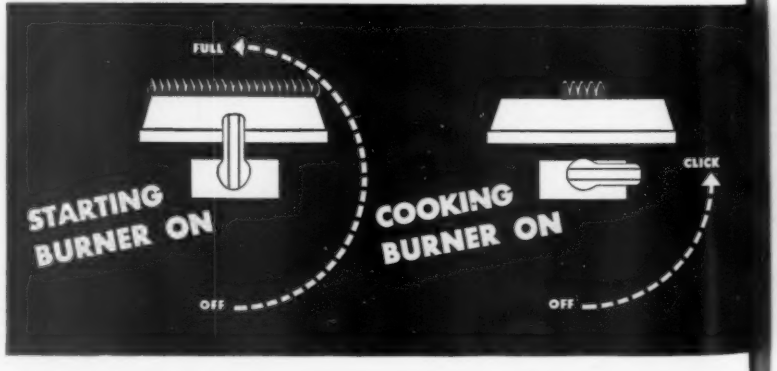
"does it better"

In many localities, there are times when it is desirable to sterilize drinking water. Boiling for thirty minutes assures complete safety—also causes certain impurities to settle to the bottom of the kettle. The water is more clear and pure. And here again is an example of why the Harper Burner System "can do it better"

The small, economical Harper COOKING BURNER provides sufficient heat to keep an eight-quart kettle boiling. More heat could not make the water any hotter, or hasten the sterilizing operation—it would only waste gas and evaporate the water from the vessel. More water is left when boiled the Harper way.

Just as in other cooking, the large flame of the Harper STARTING BURNER is used to bring the water quickly to the boiling point. Then the small COOKING BURNER is used to finish the job. Nothing complicated about it—just the simple turning of a handle.

The Harper Burner System provides a burner within a burner. The diagram below shows how the COOKING BURNER operates entirely independently of the STARTING BURNER. Yet both are controlled by the same handle.



We shall be glad to send you, without cost, two booklets that tell the complete Harper Burner System story . . . "Modern Methods of Top Burner Cooking" and "The Greatest Cooking Discovery in 40 Years". They should be valuable to anyone interested in the promotion of gas cooking and gas appliances. *Harper-Wyman Company, 8562 Vincennes Avenue, Chicago.*

SEE OTHER SIDE OF THIS PAGE

HARPER BURNER SYSTEM

A. S. A. Accepts Three Sets of Requirements as American Standards

On July 15, 1940, three sets of requirements sponsored by the American Gas Association were accepted as American Standard by the American Standards Association. These include recommended revisions to the current American Standard Approval Requirements for Hotel and Restaurant Ranges, Z21.3-1938; recommended revisions to American Standard Approval Requirements for Central Heating Gas Appliances, Z21.13-1940, which become effective on January 1, 1941; and a new set of requirements for deep fat fryers, entitled American Standard Approval Requirements for Hotel and Restaurant Deep Fat Fryers, Z21.27-1940. This action supplements an already aggressive record for 1940 in which ten sets of standards were adopted as American Standard on February 23, 1940, to become effective on January 1, 1941. These additional standards likewise become effective at that date.

Advantage was taken in revision of the current requirements for hotel and restaurant ranges to extend its scope to cover unit broilers. For this reason, its title was revised to American Standard Approval Requirements for Hotel and Restaurant Ranges and Unit Broilers, thus indicating its enlarged scope. In bringing these requirements up to date, recommendations of the Subcommittee on Test Gases and Test Pressures were incorporated. One of the principal changes was provision for testing such equipment for use with mixed gases which are being distributed over an increasingly larger area. Likewise, the former section covering performance with use of propane gas was extended to cover all liquefied petroleum gases. A new section was added covering heating capacity of hot top ranges which specifies a minimum speed of heating for such tops. Another addition of interest both to manufacturers, as well as consumers, is provision for a permanent marking of models constructed with detachable legs or bases the removal of which may affect operation with the following statement: "For Use Only With Legs or Ventilated Base." This will enable consumers to recognize proper installation of this type of equipment for satisfactory performance.

In developing equitable requirements for deep fat fryers the supervising committee felt that their scope should be limited to such equipment sold as package units for hotel, restaurant, club, or similar purposes rather than for larger commercial undertakings which are usually engineered for a given operation. Consequently, capacities of deep fat fryers covered by these new American Standards are limited to a maximum of 300 lbs. of cooking fluid.

These new standards are the result of a considerable amount of study and investigation of construction and performance of contemporary models conducted at the American Gas Association Testing Laboratories. In addition to providing complete constructional specifications to insure rigidity and durability, performance tests were designed to simulate the most severe conditions under which this type of equipment would operate in service. Of particular interest to users of deep fat fryers are limitations on temperature rise of heated surfaces in contact with cooking oil, thereby eliminating unnecessary scorching and spoilage of the cooking fluid. Likewise, temperatures near the bottom of crumb receptacles, which are a required part of all deep fat fryers, must be at least 100° F. lower than top temperatures of the cooking fluid, thus further preventing its contamination. In addition, heating capacities must be such as to develop adequate frying temperatures within a given time from a cold start.

To permit Laboratories' approval of wall-register type floor furnaces, a type recently developed to meet consumers' needs in the West and Southwest, it was felt advisable to incorporate in the American Standard Approval Requirements for Central Heating Gas Appliances such provisions which would adequately cover their safe performance under the installation conditions for which such types of units are intended. Therefore, the section on wall, floor, and flue temperatures was revised to permit testing of wall-register type floor furnaces. No part of the furnace casing, grille, or parts of the register in contact with wood or combustible wall materials may exceed a temperature of 90° F. above room temperature after operating for 2 hrs. at a rate 22-½% above normal input rating.

Other revisions deemed necessary for inclusion in the central heating requirements, which become effective on January 1, 1941, are constructional provisions for preventing condensate from entering pilot lines and their exposure to damage hazards. In addition, doors are made mandatory to cover openings for replacement of air filters for forced-air furnaces. Unless this door is designed to close by gravity or spring tension, the following statement must be permanently marked thereon: "This must be closed during operation of the furnace." This specification will assist consumers in using such equipment properly and to their greatest advantage.

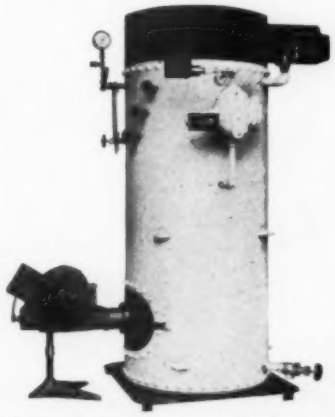
Although these requirements become effective January 1, 1941, manufacturers desiring to do so may submit their equipment for test for compliance therewith in advance of this date. For additional information on these standards, inquiries should be addressed to the American Gas Association Testing Laboratories, 1032 East 62nd Street, Cleveland, Ohio. Printed copies of these standards are available at nominal cost.

M. J. Turck Becomes Sales Manager of Renown Stove Company

Merton J. Turck has been appointed sales manager of the Renown Stove Company, Owosso, Mich.

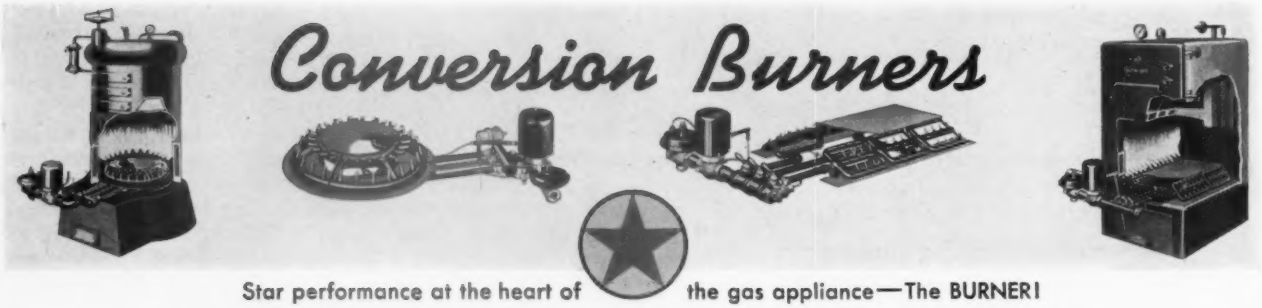
Mr. Turck comes to Renown from the Andes Range and Furnace Corporation, of Geneva, New York, where for the past year and a half he had charge of sales in Western New York and western Pennsylvania, with headquarters in Buffalo.

LATTNER
GAS — OIL BOILER
3 HP to 35 HP.



Burns natural gas or regular furnace oils with equal efficiency.

P. M. Lattner Mfg. Company
Cedar Rapids, Iowa



Star performance at the heart of the gas appliance—The BURNER!

Are *Your* Gas Appliances Equipped with BARBER BURNERS?

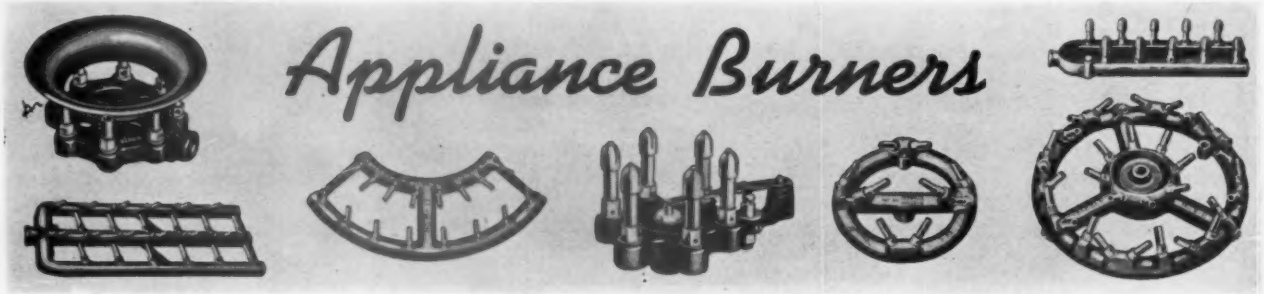
A hallmark of Quality in any gas appliance is the outstanding fact — *it is equipped with a Barber Burner!* Manufacturers to the number of 160 have adopted Barber Units as standard. The significant thing about this situation is the manufacturer's justified pride in having, as the *heart* of his appliance, the finest burner unit obtainable. The added *sales appeal* of such equipment is a potent factor in *any* merchandising picture.

In 20 years' incessant development, Barber has brought its impinged jet principle to the highest flame temperature so far attained on atmospheric pressure — 1900°. This represents almost the only advance in 25 years in basic methods of combustion, since virtually all other burners still employ the primitive "Venturia Tube" principle. In patented Barber Jet Tubes, above the gas orifice is an all-important auxiliary air feed which creates a vacuum as the pre-mixture leaves the jets, projecting into the flame the extra air necessary for highly efficient combustion on increased gas pressure. This principle is *exclusive* with Barber.

See that gas appliances which *you* buy, sell, make or sponsor are Barber-equipped. That means unrivaled efficiency, lasting service, super-economy!

Only a few *typical* Barber designs shown here. We are gas burner specialists, and offer you freely our laboratory and engineering facilities on the design and manufacture of burner units appropriate for your specific purposes. Write for complete Catalog and Price List on Burner Units for Gas Appliances, Conversion Burners for Furnaces and Boilers, and Gas Pressure Regulators.

THE BARBER GAS BURNER COMPANY, 3704 Superior Avenue, Cleveland, Ohio
Address Michigan Inquiries to The Barber Gas Burner Co. of Michigan, 4475 Cass Ave., Detroit



BARBER *Automatic* JET GAS BURNERS

"Modern Miracle House" of Boston Consolidated Gas Company a Worthy Display

1—Shows one of the additional windows featuring automatic gas water heating. The photo does not do this window full justice. What appear to be skin blemishes are in reality scores of large and small iridescent glass balls (soap bubbles), which greatly enhance the display.

2, 3 and 4 are views within the Modern Miracle House described in the adjoining text. The Glenwood CP Range and Servel refrigerator are both in operation. The "basement," No. 3, adjoins No. 4.

Many hundreds have visited, and thousands viewed a Modern Miracle House in the main building of the Boston Consolidated Gas Company, presenting the newest ideas in streamlined kitchens and basement planning.

The entire two-room Cape Cod house has been erected in the street floor display room, including exterior garden and shrubbery effects. In addition to their novel color harmonies, the modern kitchen and basement which comprise the house serve as examples of the new planning for more efficient and time-saving work in today's homes.

Featured in the kitchen are the newest CP gas range and a 1940 Servel Electrolux gas refrigerator, stocked with real food and emphasizing the ten-year guarantee of its complete refrigerating system.

The Modern Miracle House is a Brooks-Skinner portable structure with some modifications. One feature which makes it unusual is the fact that two of its sides are cut away and the house itself is built right up to the showroom windows on a busy corner, with the result that pedestrian and automobile traffic gets a full view into the brilliantly-lighted interior—giving the double advantage of outdoor and sales-floor traffic.

The kitchen is done in bright reds, with gray - and - silver wallpaper, chrome fixtures, and a large section of decorative glass blocks above the sink and CP range. Every thought has been given to eliminating steps and unnecessary motion in preparing food. The basement, however, which is nautical in its motif, is designed for leisure and enjoyment—resulting from completely automatic house heating and water heating appliances.

Strain Appointed Sales Supt.

Consumers' Gas Co., Ltd., Toronto, Ont., recently appointed A. J. Strain, formerly of Hamilton, as superintendent of domestic sales. Mr. Strain has had life long experience in the gas and gas appliance field, and plans to make the people of Toronto—the head office of Ontario's great hydro electric system—gas conscious.

YOU'RE ALL SET!

with "CLEVELANDS" DIG "ANYWHERE-ANYTIME"

WATCH YOUR COSTS GO DOWN

A balanced, correctly engineered combination of what is n e e d e d, "Clevelands" produce more "performance per pound"—pay for themselves quicker because of the additional savings they make for you.

- You have a machine that fits into "more jobs"; may even, because of a single, exclusive feature, "pay out" on one job.
- You have equipment that you can move to and from the job, faster with less expense and bother.
- You are relieved of the high maintenance cost of obsolete equipment.
- Because of "Clevelands" dependability you can rely on steady, daily output, allowing you to plan your work better and get more efficiency from your "gang."
- You save money on "Clevelands" speed and ability to "cut the buck" on tough jobs.

THE CLEVELAND TRENCHER COMPANY
"Pioneer of the Small Trencher"
20100 St. Clair Ave. Cleveland, Ohio

CLEVELANDS

Another important way "Clevelands" save for you is by low cost transportation via special trailer—"Clevelands" load and unload on trailers in 10 to 15 minutes.

Far more H_2S removal per pound of oxide . . . Savings assured under Cost Guarantee Plan! Investigate

LAVINO ACTIVATED OXIDES

famous for Saving

photograph — courtesy of Franklin Institute, Phila.

LAVINO ACTIVATED OXIDE. Supplied in unmixed form . . . ready for mixing with your own carrier . . . Lavino Activated Oxide is readily adaptable to the needs of your plant, whatever its size or requirements. Composed of 70% Fe_2O_3 as received; approximately 10% moisture.

LAVINO ACTIVATED SLURRY. A new development in purifying materials, is shipped in steel drums . . . ready, with the addition of a small amount of water, to mix with any type carrier. Is used successfully also as a catalyst in liquid purification. Contains 55% Fe_2O_3; 25% to 30% moisture.

LAVINO ACTIVATED SPONGE is furnished ready mixed, carefully coated on large, tough, specially selected hardwood shavings.

ALL ARE made in the United States, are readily available. All are disinfected by a special Lavino process to minimize formation of mold or other fungus growth.

★ ★ *AMERICAN MADE* ★ ★

E. J. Lavino and Company

1528 WALNUT STREET • PHILADELPHIA, PENNSYLVANIA

Book Reviews

Elements of Utility Rate Determination, by John M. Bryant, Professor of Electrical Engineering, University of Minnesota, and Raymond R. Herrmann, Rate Engineer, Northern States Power Company. McGraw-Hill Book Company, 1940. 475 pages, 6" x 9". Price $4.50.

The purpose of this book is to cover the field of public utility rate determination, service, and discrimination from the viewpoint of the engineer and manager rather than from that of the lawyer or economist. The authors discuss reasons for regulation of utility rates, describe the methods used to accomplish such regulation, and outline the practical limitations involved.

The book is divided into the following sections: Valuation, Depreciation, Expenses, Return, Discrimination, Rates and Service.

There are copious references to legal decisions, in fact the book is built on these. However, it is essentially a text book and not a compilation of case abstracts.

The various subjects have been treated in a simple, direct and easily understandable way, that enhances the value of the book to the executive and even to the rate engineer.

Bureau of Standards Issues Standards for Pipe Nipples, Brass, Copper, Steel and Wrought-Iron. (Commercial Standard CS5-40) Effective May 10, 1940.

This is a revision and consolidation of CS5-29, CS6-31 and CS10-29.

"On January 29, 1928, a joint conference of representative manufacturers, users, and general interests adopted recommended commercial standards for steel and wrought-iron pipe nipples, which were accepted in writing by those concerned and published as Commercial Standards CS5-29 and CS6-29, respectively. In 1931, upon recommendation of the standing committee, a revision of the latter was accepted and issued as CS6-31.

"Similarly, as a result of a joint conference on December 14, 1928, followed by written acceptances, there was published Brass Pipe Nipples, Commercial Standard CS10-29.

"On January 10, 1940, at the recommendation of the combined standing committee, a recommended revision and consolidation of the three commercial standards proposed by the National Association of Pipe Nipple Manufacturers, was circulated for acceptance. Those concerned have since accepted and approved for promulgation by the Department of Commerce, through the National Bureau of Standards, the revised standard.

"The standard is effective for new production from May 10, 1940."

Copies of the new circular giving the new standard may be obtained from the Superintendent of Documents, Washington, D. C. Price 5 cents.

The Detection and Identification of War Gases. Ministry of Home Security, Air Raid Precautions Department (England). Chemical Publishing Company, Inc., New York, 1940. 57 pages 5½" x 8½". Price $1.50.

This is a very complete little book on war gases, their physical properties, chemical reactions and tests, subjective tests, objective tests, and identifications.

CONTENTS

I. The War Gases: Introductory: General Considerations, Classification, General Properties.

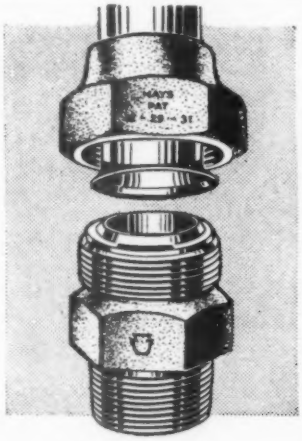
II. The War Gases: Physical and Chemical Properties: Lung Irritants, Lachrymators, Nose Irritants, Vesicants, Paralysants.

III. Principles and Methods of Gas Detection: General, Methods Available, Subjective and Objective Methods, Field Testing and Sampling.

IV. Duties and Responsibilities of Gas Identification Officers; Organization of Gas Detection and Identification Service, The Element of Surprise in Gas Warfare, Foreign Gas Detection Services.

V. Chemical Identification of War Gases: Chemical Reactions of War Gases, General Laboratory Technique.

Tables: Physical Properties, Chemical Reactions and Odor and Irritant Effects of War Gases.

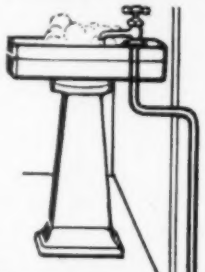


400 Styles and Sizes of Hays Double Seals. Approved by Underwriters Laboratories.

ECONOMICAL INSTALLATION

SELLS MORE

WATER HEATERS



By installing ⅜" Copper Tubing by Hays Copper Plumbing Method in place of ¾" Galvanized Pipe in 37 ft. length from storage to faucet, it was possible to deliver hot water at 150° F. for 1,930 cu. ft. of gas per month or at $1.60 per M.C.F. — $3.00.

Same installation with ¾" Galvanized Pipe required 2,650 cu. ft. of gas at a cost of $4.04.

The above performance is an average of 34 tests conducted to prove the economy of small size copper tubing for hot water lines. Write for Hays Catalog on Copper Plumbing. Sell economy and you sell more heaters.

HAYS MFG. CO., Erie, Pa.

A Dictionary of Metals and their Alloys, their Composition and Characteristics. Edited by F. J. Camm. Chemical Publishing Company, Inc., 1940. 245 pages 5¼ x 8½". Price $3.00.

We believe that this is the first alphabetically arranged dictionary of metals and their alloys yet published. With an evergrowing list of new alloys having special properties and intended for particular uses, it is important that engineers should have at hand information about the analysis and characteristics of them.

This book includes such information about every known metal and almost every type of commercial metallic alloy. It is adequately cross-referenced throughout, and in some cases historical facts have been included.

There are special sections on hardening, case-hardening and tempering, electroplating, polishing, chemical coloring, metal spraying, rustproofing, and useful tables.

CONTENTS—Dictionary of Metals, Heat Treatment of Tool Steels, Practical Hints on Hardening and Tempering, Spray Method of Coating Surfaces with Metal, Rustproofing Iron and Steel, Electroplating, Copper Plating, Chromium Plating, Rhodium Plating, Silver Plating, Polishing and Finishing Metal, Chemical Coloring of Metals, Tables of Elements, Table of Principal Elements Arranged in Order of Valency, Metallic Elements and their Properties, Melting Point of Various Metals, Fluxes of Soldering, Compositions of Soft Solders, Composition of Hard Solders, Density, Specific Heat, Boiling Points, etc., Copper Wire Data, Wire and Sheet-Metal Gauges, Approximate Weight of a Cubic Inch of Metals, Shrinkage of Castings, Brinell Hardness Numbers, The Hardness Test.

Wage and Hour Manual. Published 1940 by The Bureau of National Affairs, Inc., Washington, D. C. 648 pages 6" x 9".

This volume includes laws, rulings and interpretations in wage-hour regulations, including Federal and State statutes and court opinions relating to minimum wages, maximum hours, child labor and public contracts. It is intended as an authoritative guide to employers subject to regulation by Federal or State Governments in regard to the minimum wages which they are required to pay and in regard to the hours during which their employees may be required to work. It is intended also as a guide to employees for the purpose of showing them what their rights are under Federal and state laws regulating wages and hours.

The Manual is in three parts.

Part I provides the most complete and most readily understandable map yet constructed of the territory covered by the Fair Labor Standards Act. The material for the most part is official. It is presented, not only as a code to be consulted, but as a guidebook to be used in solving day-to-day problems that arise under this rather complex statute. Those wishing to use the Manual as a reference source will find the text of the Act, the documents which make up its legislative history and the Rules and Regulations issued under it, all assembled in one chapter.

Part II of the Manual is a source book and guide to regulations regarding wages and hours that must be observed by those bidding on contracts with the Federal Government.

Part III does for state wage-hour laws what Part I does for the Fair Labor Standards Act.

Gas Appliance Selling Features. Prepared by the Sales Development Committee of The New England Gas Association, Boston, Mass. 53 pages.

This little booklet is a part of the Sales Training Program, which has been one of the outstanding activities of the New England Gas Association.

It lists 389 selling features of (A) Automatic Gas Cooking, (B) Automatic Gas Refrigeration, (C) Automatic Gas Water Heating, (D) Automatic Gas Kitchen Heating and (E) Automatic Gas House Heating.

It will be particularly useful to gas appliance salesmen, sales managers and supervisors, home service representatives and advertising copy writers.

Inquiries should be addressed to The New England Gas Association, 41 Mount Vernon Street, Boston, Mass.

Lessons in Arc Welding, published by The Lincoln Electric Co., Cleveland, Ohio. 144 pages 6 × 9 inches; over 100 illustrations, including photos and drawings; cover semi-flexible simulated leather, gold embossed.

This book will be found helpful not only by beginners learning to arc weld but also by experienced welders desiring the comprehensive practical information contained in the volume, also by welding officials, such as supervisors, foremen and instructors, and others seeking a ready reference to fundamental information on arc welding and a guide to its proper application.

Lessons in Arc Welding is a series of 51 lessons, based upon experiences of Arthur Madson, instructor of The Lincoln Arc Welding School, presenting in concise manner fundamental facts of welding, knowledge of which will enable the welder to utilize the welding process successfully and economically.

Beginning with an introduction giving preliminary instructions to the welder, including suggestions as to making and following a definite plan, learning the fundamental principles of arc welding, practicing continually, examining welds, criticizing and inviting criticism of work, wearing proper protective apparel at all times, and assuming proper working position, the 51 lessons are covered in four principal sections: Welding with Unshielded Arc Electrodes; Welding with Shielded Arc Electrodes; Electrodes for Particular Joints and Metals; Hard-facing.

Nineteen lessons comprise the instruction in use of unshielded arc electrodes. These cover: the arc welding machine, its control, definitions, etc.; striking the arc and running horizontal bead; running straight bead not less than 12 inches long; weaving, or movement of electrodes; effect of arc length, amperes and speed on bead; effect of polarity on bead; different electrode sizes and their uses; padding, building up plates; building up shaft; butt welds; lap welds; tee welds; vertical welds—lap, butt, tee; horizontal welds; horizontal joints, lap; overhead welding; overhead welding—lap, butt, tee; expansion—contraction.

The 9 lessons on use of shielded arc electrodes cover: the shielded arc and its uses, running horizontal bead; butt welds—no vee—no backing; horizontal lap welds; tee—fillet welds; vertical welds; vertical—lap and fillet welds; overhead—butt welds; overhead—lap and fillet welds; penetration—cutting.

Instruction in use of electrodes for particular joints and metals consists of 15 lessons. Eight lessons comprise instruction on hard facing.

Text explanations are graphically supplemented by line drawings and photos for ready understanding.

Lessons in Arc Welding may be obtained directly from The Lincoln Electric Co., or through any of its dealers or representatives, or through any recognized book dealer. Price is 50 cents per copy postpaid anywhere in U.S.A., 75 cents elsewhere.

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Unbreakable MANOMETERS

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Made in U.S.A. 100% American Materials

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In the Low Pressure Field, where sensitive regulation is so essential, REYNOLDS offer extreme accuracy—the ability to keep small volume delivery pressure uniform, even if the line pressure varies. REYNOLDS Regulators are precision-built and delicately balanced for accuracy. All Reynolds Regulators give 100% operating performance—they are rugged, long lived and sensitive.

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No. 268 Park St.
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GAS CONTROL SINCE 1892

REYNOLDS GAS REGULATOR CO.
ANDERSON, INDIANA, U. S. A.

CURRAN-KNOWLES GAS AND COKE OVENS

Successfully carbonize Low Volatile, High Volatile, Swelling or Non-Swelling Coals.

Give a high yield of superior quality coke for water gas generator fuel, industrial and domestic use; a high yield of tar of excellent quality and a uniform quality of gas which meets Commission requirements.

Top of Ovens Curran-Knowles Plant in British Columbia, Canada, where low volatile expanding coal is carbonized.

Substantial construction. Low initial cost per M. capacity. Low operating cost due to simplicity of design.

Built to suit any situation. Over 5 years' successful operation.

Ask for bulletins showing plants and products.

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under High Pressure

You can handle pressures up to two thousand pounds under perfect control and pass on to your distributing lines whatever reduced pressure may be called for by use of the proper C-F Regulators. There are standard regulators for all pressures up to 600 pounds—for higher pressures designs are adapted to suit specifications. Ask for new catalog.

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TITAN WATER HEATER CONTROLS

AGA Approved TITAN Temperature and Pressure Relief Valve

This device is installed on the hot water outlet in the tank directly in the flow of water. Action, as a result, is unfailing and positive, there being no dead pockets to prevent proper functioning of relief valve.

Pressure relief is obtained through a spring-loaded valve which opens when the pressure reaches a predetermined point. Should the water become overheated to 200° F, a fusible disc melts and lets the water escape thereby preventing a further increase in temperature.

The Titan Relief Valve serves as a coupling connected in the line thereby eliminating the necessity and expense of a tee fitting. To replace fusible disc, it is not necessary to disassemble valves or piping in any way.

Design for application to storage or range boilers. Prevents corrosion, scalding and explosion.

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Stimulate Water Heater Sales

HOUSEHOLD GAS WATER HEATING

By Charles W. Merriam, Jr.

Nine chapters of the true essence of this subject.

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What Size Heater?
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Hot Water—For What?

"A Book like this has long been needed to enable our salesmen to present a sound and convincing attack on this most worthwhile business of our industry."—A. M. Beebee, Gen. Supt. Gas Dept., Rochester G & E Co., Rochester, N. Y.

"A Real contribution to the gas industry."—R. A. Koehler, Chairman, A.G.A. Water Heating Committee.

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AMERICAN GAS JOURNAL
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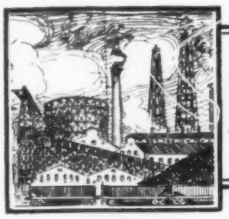


News of the Gas Industry

Convention Bound

Strong A.G.A. Program Reflects World Events

While the world waits anxiously for a decision in the tremendous European struggle now waging, the gas industry is marshalling its resources for a national convention that will prove beyond doubt its great and essential service to the American way of life. National defense and the contributions of the industry to better living will be the dominant themes in a closely knit program featuring scores of national authorities on a wide range of subjects.

The twenty-second annual meeting of the Association will be held at the Playground of the World—Atlantic City—starting the week of October 7. Let no one mistake, however, the seriousness of the convention, nor the important problems which will be presented there. It will be, by all odds, the most significant meeting in many years. The Program Committee, headed by George S. Hawley of Bridgeport, Conn., has taken into account the pressing national events which are shaping the future.

Walter C. Beckjord, president of the American Gas Association, and vice-president and general manager of Columbia Gas & Electric Corp., will appear early on the program with a keynote address on "The Gas Business in the Modern World." In his usual forthright manner President Beckjord, will analyze the gas industry's position in the light of experience gained this year as leader of the Association's cooperative undertakings. He will also preside throughout the general sessions of the convention.

Special attention will be devoted to national defense and the gas industry's opportunities in the rearmament program in an address by Franklin T. Rainey, of Columbus, Ohio, chairman of the Association's Industrial Gas Section. This subject will be dealt with further in a symposium of industrial gas sales managers at the Wednesday Industrial Gas meeting, under the leadership of Henry Obermeyer, assistant vice-president, Consolidated Edison Co. of New York, Inc. Technical phases of the national defense program will be probed at the Technical Section meetings during the convention.

The consumer movement has been receiving much attention, even in these war-conscious days, and is labeled the most significant movement of the day. In recognition of this trend, John Benson, president of the American Association of Advertising Agencies, New York, has a prominent place on the general sessions program. In an address entitled "The Consumer Movement Is With Us—What About it?" he will attempt to evaluate its significance and point out the possibilities of consumer education in regard to advertising and advertised products, with particular attention to the gas industry and its national advertising program.

Frank H. Adams, president of the Association of Gas Appliance and Equipment Manufacturers, in an address on "A United Front," will further emphasize the Siamese-twin relationship of the appliance manufacturers and the gas distributing companies.

One of the recognized fathers of air conditioning, Dr. Willis H. Carrier, chairman of the board of Carrier Corporation, Syracuse, will address the convention on this most important topic. A noted scientist, Dr. Carrier has many patents and other contributions to his credit and is especially known for his pioneer work in the development of the science of air conditioning.

The award of honors for outstanding achievement will again be a part of the general sessions' program. These include: McCarter Medals for outstanding acts of life saving; the Charles A. Munroe Award for the greatest individual contribution to the general advancement of the gas industry; the Beal Medal for the best technical contribution to Association meetings throughout the year, and the A.G.A. Meritorious Service Medal for the individual who is judged to have performed the most meritorious act during the year.

CONVENTION CALENDAR

September

6-7 *Maryland Utilities Assn.* Annual Fall Convention, Ocean City, Md.

18-20 *Pacific Coast Gas Assn.* Annual Convention, Hotel del Coronado, Coronado, Calif.

26-27 *Empire State Gas & Electric Assn.*, Annual Convention, Westchester Country Club, Rye, S. Y.

October

7-11 *American Gas Assn.* Twenty-second Annual Convention, Atlantic City, N. J.

21-25 *National Metal Congress and Exposition*, Cleveland. Will have Combined Industrial Gas Exhibit sponsored by AGA.

November

11-13 *Mid-West Gas School and Conference*, Iowa State College, Ames, Iowa.

The second annual award of the Gild of Ancient Supplers will also be made at one of the geenral sessions. This organization is limited to men of at least ten years' service to the gas industry and all Supplers are executives and representatives of concerns who make or distribute appliances, equipment, supplies or services to gas companies. The first award, last year, went to R. M. Conner, director of the A.G.A. Testing Laboratories.

The sectional meetings, which will be held throughout the week, will specialize on various phases of the industry's operations and the most pressing problems facing these branches of the gas business.

Monday, October 7, will be Natural Gas Day at the convention. The morning will be devoted to important natural gas technical and research committee meetings, while the formal program will be held in the afternoon. A novel luncheon meeting is being planned for the visitors.

"Home Service in the American Way of Living" will be the theme of the program at the Home Service Breakfast to be held Wednesday morning at the Hotel Traymore. This theme was selected to emphasize the influence which can be exerted by home service workers in their daily contacts with women customers. Mrs. Eliza M. Stephenson, of the Jersey Central Power and Light Co., Asbury Park, N. J., will preside as chairman of the Home Service Committee.

The home service program is composed of a group of short talks by home service directors and will deal with the subjects of sales floor activities, maids' classes, school contacts, radio and advertising. Greetings from Association executives will be followed by a Cook Book Review during which authors of well known cook books will be introduced.

Prominent men from outside the gas industry will make addresses at the general sessions on subjects of vital interest to the industry.

The Entertainment Committee of which John St. John of Madison, Wisconsin, is Chairman, is busy making the numerous arrangements for a program of entertainment which it is believed will be attractive. There will be a card party and tea for the ladies in a beautiful setting at the Ambassador Hotel on Wednesday, October 9. Present plans also include a surprise party for all at the Traymore Hotel on Tuesday evening, October 8, and a dance in the ballroom of the Auditorium on Wednesday evening, October 9. It is expected that a large assortment of useful and valuable prizes will be distributed at the surprise party. There will be plenty of fun for all who attend this party, the committee promises. At the dance a well known band is being engaged so that good music will be assured. Between dances

there will be several features which in themselves will afford a pleasant evening.

Earl W. Roberts of Cleveland heads the committee in charge of the ladies' card party and tea, W. S. Guiteau of New York is directing arrangements for the surprise party, while W. G. Murfit of Philadelphia is supervising the conduct of the dance. The Entertainment Committee is made up of men who know how to give people a good time and all are generously contributing their help in advance arrangements and will be on the job at Atlantic City to see that those arrangements are successfully concluded.

Gas Water Heater Promotional Plans

Plans for national promotion of gas water heaters in 1941 will be discussed at a meeting of the Gas Water Heater Division of the Association of Gas Appliance and Equipment Manufacturers to be held at the William Penn Hotel, Pittsburgh, Pa., on September 10, as announced from the Association's headquarters, 60 East 42nd Street, New York City.

A report of the sales promotion committee of the Division will be made to the meeting reviewing activities carried on since the beginning of the year. Matters relating to laboratory activities and market trends are also scheduled for discussion.

L. R. Mendelson, chairman of the Gas Water Heater Division and president of the Hotstream Heater Co., of Cleveland, Ohio, will preside.

A. S. H. V. E. Fall Meeting

Dr. F. E. Giesecke, College Station, Texas, President of the American Society of Heating and Ventilating Engineers, announces that the first Society Meeting ever held in Texas will be the 1940 Fall Meeting, October 14 and 15 at Houston, Tex., and the South Texas Chapter will be host for the occasion. The Council has authorized a two-day session at which six technical papers will be presented. Headquarters for the meeting will be at the Rice Hotel.

Southern Counties Gas Company Announces Changes in Personnel

Carl Summers, for many years district manager of the Ventura and general pipe line district, resigned on July 1st to engage in other activities. His place was taken by Justin M. Kennedy, formerly district manager in the Monrovia district.

A. E. Madden, district superintendent of Monrovia, was promoted to the managership of the district and his former position was filled by H. W. Keiser who was his assistant.

In the Whittier district R. W. Gregory, former district superintendent at Santa Barbara, succeeded to a position of district superintendent left vacant by the resignation of Roy F. Blankenship who resigned on June 15th. R. C. Merrick was transferred from the Gas Distribution Department in the Santa Monica district to succeed Gregory in Santa Barbara.

Gas Industry Day at the New York World's Fair is Friday, October 11

Here is real news for delegates who attend the Association's convention in Atlantic City, October 7-10. The convention ends Thursday afternoon the 10th. Early the following afternoon—Friday, the 11th—the gas industry's big party starts going places and doing things at the 1940 New York World's Fair.

First you will receive a free ticket of admission by courtesy of the Metropolitan New York Companies. Then you will be given a key to the Fair's "Golden Key Contest" which may win you an automobile, we hope, we hope.

Once inside the Fair gates the first step is our industry's own Gas Wonderland—flagstones that talk—Tiny Town with houses that open up and talk—the kaleidoscopic fountain—a show totally different from last year—a show that is drawing *22%* of the entire gate!

2 to 6 P.M.—Open house in the private lounge of Consolidated Edison's spectacular "City of Light" exhibit, with the company as your host. You will witness a magnificent spectacle—a gargantuan New York, from Coney Island to far away Westchester County. This greatest of dioramas on a circular stage more than a city block long makes New York come alive before your eyes.

5 to 7 P.M.—Cocktail party for Association officers and convention delegates by Association of Gas Appliance & Equipment Manufacturers, Court of Flame Club, Gas Wonderland. Good fellowship and a lot of fun.

6 to 6:30 P.M.—Special broadcast program by Station WINS and three-minute talk by President Beckjord in Gas Wonderland Auditorium.

8 P.M.—Dinner in a famous pavilion overlooking spectacular Lagoon of Nations fountain display. Special music during dinner. Ticket arrangements to be announced later.

9:15 to 9:30—View of Lagoon of Nations display from pavilion. You who saw this vast, colorful fire-water-fireworks extravaganza last year were thrilled. It is even better this year.

9:45 P.M.—Fireworks display in Fountain Lake, Amusement Area, and tour of attractions.

Any member of the gas industry is welcome to attend the dinner and join the gang in the Amusement Area and Gas Wonderland but admission to Consolidated Edison's open house, the A.G.A.E.M. cocktail party and the WINS broadcast is restricted to Atlantic City convention delegates who wear the official convention badge.

Plant at Amarillo, Texas, has Produced 100 Million Cubic Feet of Helium

The world's only operating helium plant—maintained by the United States Government near Amarillo, Texas—has completed production of 100 million cubic feet of helium, according to the Bureau of Mines.

Figures recently compiled show that the plant has produced 100,012,000 cubic feet of helium during its operating life of a little more than eleven years. Even this production is less than 50 per cent of the potential output for an equal period if the plant were run at its rated capacity. Altogether, the Government has produced nearly 150 million cubic feet of helium, as 48 million cubic feet were produced at Fort Worth, Texas, before the Amarillo plant was placed in operation.

Helium was known to exist in the atmosphere of the sun 27 years before it was found on earth. For another 23 years it remained a chemical curiosity. Those who possessed small amounts, measured in cubic centimeters rather than cubic feet, were able to demand a price equivalent to $2,500 per cubic foot. The plant at Amarillo at present produces helium at a cost of less than 1½ cents per cubic foot.

Large-scale production of helium was developed by the Government during the last World War. It is now being used in millions of cubic feet per year for a variety of purposes.

In 1925, under a cooperative arrangement between the Bureau of Mines and the U. S. Navy, Dr. R. R. Sayers, now Director of the Bureau of Mines, and his associates carried on the first research looking to the use of helium and oxygen as an artificial breathing mixture. The results led directly to the use of such mixtures in deep-sea diving. Indirectly it has led to the use of similar mixtures in the treatment of asthma and other respiratory diseases, and in the administration of certain anesthetics.

Realizing the importance of helium in medical, scientific, and commercial application, the Congress passed legislation in 1937 permitting the Bureau of Mines to sell it to private parties. This has resulted in the sale of more than one half million cubic feet of helium for medical use during the last year.

Liquid Natural Gas Plants For Peak Loads
(PATENTED)
The method of distributing a gas which comprises liquefying the portion of the gas delivered through the transmission line in excess of the momentary demand of the distributing system, storing the liquefied gas in the liquid condition, regasifying the liquid gas at times of increased demand and delivering the gas to the distributing system.
The Gas Machinery Co. Cleveland, Ohio

CP Range Portfolio Describes Promotional Plans

A Fall-Winter sales promotion campaign in behalf of CP Gas Ranges, conducted by the Association of Gas Appliance and Equipment Manufacturers and the American Gas Association was launched early in August with the distribution of a colorful campaign portfolio with the theme, "The American Homemaker Speaks."

Designed primarily for and adapted to the requirements of gas companies, this new portfolio was mailed to key executives of gas operating companies in the United States and Canada. A revised edition carrying the same theme but meeting the needs of department stores, specialty shops and other dealer outlets will also be distributed early in September.

The campaign portfolio, pointing out the advantages to gas companies in promoting CP ranges, outlines possibilities for sales stimulation through better informed and adequately trained personnel, by the use of the advertising and promotional material made available through the Association of Gas Appliance and Equipment Manufacturers, and by taking advantage of the services to gas companies of the Association's staff of field sales counsellors.

Compiled editorially under the head "See What Three out of Four Say," the portfolio is divided into three parts. The first section is keyed to "The Homemaker Speaks" and illustrates the preference of the majority of housewives for modern kitchens equipped with up-to-the-minute gas ranges as evidenced by recent market analyses and statistical compilations.

The second part deals with "The Gas Industry Speaks." This includes actual case histories of successful CP promotions by leading gas companies in various parts of the United States.

The last and principle division outlines how gas companies can apply the facts and successful experiences described in the first two sections to their own sales work. Emphasized here are the three essentials for successful promoton: (1) advertising, (2) consumer inducement, (3) incentives for salesmen. Also included are samples of the advertising and promotional material available to the gas companies from the A.G.A.E.M.; suggested rounded-out localized promotional campaigns; and a suggested contest for the selling organizations.

An important service being offered to gas companies for the first time by the Association in connection with the Fall-Winter CP promotional campaign is the "Audio Training" which is a practical method of improving the actual sales presentation of the individual salesman. This new service gives the salesman the opportunity of hearing himself as others hear him and of judging himself as others judge him. This is accomplished through the use of voice recording equipment.

Measuring 8½ by 11 inches, the book is printed on heavy stock with a cover lay of heavy cellophane and bound with plastic rings.

Ammonium Thiocyanate Plant Erected by Koppers Company

The first commercial plant in the United States for the production of Ammonium Thiocyanate crystals, valuable industrial and agricultural chemical, is soon to begin operation, it is learned from Koppers Company, Engineering and Construction division.

The plant eventually will be able to produce 1800 tons of Ammonium Thiocyanate a year in various grades.

The chemical will be recovered from manufactured gas and will be purified and ready for use in three grades—crude liquor, crude crystals and technical quality crystals, it is stated.

At present supplies required by industry and agriculture have to be imported principally from abroad. As a result, it is said, many users have been employing substitute chemicals which lack certain advantageous properties to be found in Ammonium Thiocyanate.

This chemical is the basis of many resins and is of great importance to the textile industry where it is employed in the dyeing, finishing and printing of cloth, in the chemical industry where it is used as a reagent and starting point for a number of other chemical compounds, and in agriculture as an insecticide, fertilizer and weed killer.

It also is used by the metallurgical industries in the coating of zinc, in photography as a reagent in the creation of several photographic compounds, in the refrigeration and air conditioning industries in the manufacture of freezing solutions, and in pharmacy for the compounding of certain medicinal prescriptions.

Otto Construction Corporation Announces New Office Location

Otto Construction Corporation, builders of Otto Coke Ovens and equipment for by-product recovery and treatment has opened offices at 500 Fifth Ave., New York.

The Otto Oven is of the "hairpin-flue" type with underjet for lean gas and air and with high and low burners.

New Gas Line in Western Pennsylvania

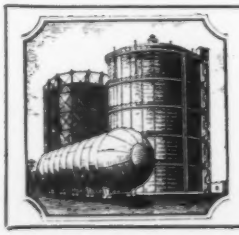
The second 100-mile Dresser-coupled steel pipe-line for natural-gas transmission to be constructed in the past few years is being planned as part of a program of expansion by Manufacturers Light & Heat Co., Manufacturers Gas Co., and Pennsylvania Fuel Supply Co., all of Pittsburgh, and all affiliated interests of Columbia Gas and Electric Corp., New York.

Cost will be approximately $1,800,000. Line will extend through Western Pennsylvania from Monaca, Pa., near Beaver and Rochester, to the New York State Line at Knapp Creek (between Bradford and Olean).

At Monaca, a line will connect with a pipe-line from West Virginia gas fields, source of supply, operated by United Gas Fuel Co., Charleston, W. Va., and at terminus with connecting line to Olean, Binghamton, and vicinity, where distribution will be carried out by local utilities affiliated with Columbia interests. New pipe-line system will carry 2,500,000,000 cu. ft. of natural gas annually to consumers for the next 15 years. Purpose of the new transmission hook-up is to make sure that war industries in Southern New York State will not be hampered by lack of gas.

Application for the new construction work was filed with the Public Utility Commission partly because of failure of the Oriskany sand in Tioga County to provide an adequate fuel supply. The Oriskany sand in the northern tier of Pennsylvania counties boomed in the early 1930's, promising a new source of cheap fuel for industrial cities in New York State. But within the last year, the sand had "petered out" and gas companies have been compelled to look farther south to the active fields of West Virginia, Ohio, and Southwestern Pennsylvania for their future supply. Without the new construction, a critical shortage of gas is said to be imminent this year even with a mild winter. Supply to 50,000 commercial and domestic consumers in Binghamton, Johnson City, Endicott, Olean, Nyack, Port Jervis, Goshen, and Middletown, N. Y., would have been endangered.

Total mileage of the line consists of about 115 miles. Work started on the right-of-way July 25. First couplings were shipped August 1. About three months will be required to complete the line. The contract has been let to Williams Brothers Corp. of Tulsa, Okla., the same firm that constructed the 100-mile Dresser-coupled, 20"-16" line in 1937, from Sissonville to Cedarville Station, W. Va. H. L. Davis is contractor's superintendent.



STACEY BROTHERS
Gas Construction Co., Inc.
"STACEY-KLONNE" & TELESCOPIC GAS HOLDERS "STACEY BULLET" PRESSURE HOLDERS
Executive Offices: Cincinnati, Ohio
PURIFIERS AND STEEL PLATE CONSTRUCTION
Eastern Office: 21 West St., N. Y. C.

Norman R. McKee, vice president in charge of sales, and Clyde H. Potter, sales manager of Southern Counties Gas Company, receive clipper ships from Carrol A. Miller, regional sales manager for Servel, Inc., as awards in the national A. G. A. refrigeration contest at a Victory Dinner held in Los Angeles. William Reynolds, advertising manager for Servel, Inc., New York, attended the affair.

A group of sales officials who attended Southern Counties Gas Company Victory Dinner recently.

Bottom row: A. R. Combs, Electrolux representative (left), R. E. Honey, Commercial Agent, Monrovia District, G. F. Scherer, Ventura District, T. G. Allender, San Pedro District, G. F. Rapp, Whittier District.

Top row: Clyde H. Potter, sales manager (left), H. M. Wilcox, Commercial Agent, Santa Monica District, W. L. H. Geldert, Orange County District, J. A. Somers, Electrolux dealer representative.

"Victory Dinner" of Southern Counties Gas Company

As a climax to the 1940 National A.G.A. Refrigeration Campaign the entire sales organization of the Southern Counties Gas Company of California held a Victory Dinner on the night of August 19th at the Mayfair Hotel, Los Angeles, attended by one hundred and six officers, executives and sales representatives of the company.

F. S. Wade, President of the Southern Counties Gas Company and the Southern California Gas Company, A. F. Bridge, Vice President and General Manager of the Southern Counties Gas Company, N. R. McKee, Vice President in Charge of Sales, were present and congratulated the sales organization on its outstanding showing. C. A. Miller, Regional Sales Manager of Servel, Inc., presented the two model Clipper Ship awards won by the company to Mr. McKee and Clyde H. Potter, Sales Manager, who acted as toastmaster for the occasion. William Reynolds, Advertising Manager, and Arthur L. Spring, Southern California Manager, as well as Jesse Powers, Sales Representative, of Servel, Inc., also were guests at the speakers' table.

Mr. McKee announced that in the event the Company maintains its present position and should win two Bermuda awards, one should go to the winning Commercial Agent of the Company and the other to Mr. Potter.

Cash awards amounting to $105.00 were presented by Mr. Potter to the following Southern Counties Gas Company sales representatives for outstanding sales efforts during the "Pioneers of Progress" Campaign recently closed: E. F. Chamberlain, Santa Ana, $50.00; Floyd S. Parmenter, Monrovia, $35.00; James A. Merigold, Santa Ana, $20.00.

In addition to the above awards Mr. Potter handed out the July "New Horizon" Contest checks to the sales organization as follows: Floyd S. Parmenter, Monrovia, $15.00; H. W. Swanson, Santa Monica, $10.00; Ray C. Houck, Monrovia, $10.00; and James A. Merigold, Santa Ana, $5.00. This makes a total of $715.00 in cash awards that have been annexed by twenty-one of the Southern Counties Gas Company salesmen in the Contest to date.

A highlight of the Victory Dinner was the reading of a telegram by Mr. Potter from Mr. B. T. Franck, Chairman of the A.G.A. Refrigeration Committee, expressing his regret in being unable to attend the meeting and announcing that the Southern Counties Gas Company as of July 31st still leads Division I in two classifications: greatest percentage of increase over last year's sales and greatest sales per 10,000 meters.

Southern California Gas Co. Is Erecting New Office Building

Representing the first major office building constructed in downtown Los Angeles since 1936, Southern California Gas Company has announced the construction of a class "A" reinforced concrete building. It is estimated that the total cost of the structure with land and equipment will be in excess of $300,000.

It will be located immediately south of the company's present headquarters at 810 South Flower street and to be ultimately six stories in height. Four stories and basement will be built now and will cover an area 60 feet along the street front by 150 feet deep. Construction was started August 26th and is to be completed shortly after the first of the year.

Pacific Coast Headquarters of Sprague Meter Co.

The Sprague Meter Company, Bridgeport, Conn., announces the opening of their new Los Angeles branch and warehouse at 2840 E. 11th Street, Los Angeles, September 21, 1940. Visitors and guests are cordially invited to inspect the new modern building which was erected to better serve the Pacific Coast and the states of Colorado, Wyoming and Montana.

This new building, located in the Hostetter Industrial Tract of Los Angeles, contains 15,000 sq. ft. of floor space, is fireproof, earthquake resisting, has modern office facilities, the latest in proving room equipment, railroad siding, and all conveniences to render the utmost in service to the Gas Industry.

Mr. E. H. Roseberry, Vice President of the Sprague Meter Company and manager of the division, will welcome the Company's many friends who attend the opening ceremonies.

THE GOODMAN STOPPER

Now has the "Z" handle for easy manipulation. When locked in place it holds. Stopper cannot slip. Gas cannot pass. Adjusted in 30 seconds.

Ask for circulars on this and other distribution equipment.

Nearly a half century of service to the Gas Industry.

The Reliable Shut-Off for Street Mains

Safety Gas Main Stopper Co.
523 Atlantic Avenue, Brooklyn, New York

A. Gordon King Appointed Secretary of Technical Section of A. G. A.

Announcement has been made by Major Alexander Forward, Managing Director of the American Gas Association, of the appointment of A. Gordon King as Secretary of the Technical Section, which became effective August 1st. Mr. King, who has been Service Engineer for the past 17 years, succeeds the late Hugh W. Hartman.

Mr. King has had most thorough education and broad experience in gas production and distribution. He has wide acquaintance in the industry especially with engineers and other technicians and has worked closely with the section, having been at times its acting Secretary. His occupation has also given him valuable knowledge of regulation, rate making and standardization.

Trained and educated for the gas industry in England, he holds the full technological certificate of the City and Guilds of London Institute, honors grade, in gas manufacture and allied subjects, as well as the honors grade certificate and prize of the Regent Street, London, Polytechnic in gas manufacture. He is a member of the Institution of Gas Engineers and a licensed professional engineer of the State of New York.

As a member of the A.G.A. Headquarters staff, Mr. King has been Secretary of several general committees, including Standards and Service, Rate Fundamentals, Aids in Aviation, Purging Gas Holders and Gas Works Apparatus. He is Secretary of the recently created Association Committee on National Defense.

A. G. A. Camera Contest

The American Gas Association offers a new and different challenge to amateur photographers through a nation-wide contest for the best photographs of up-to-date, attractive kitchens which show modern gas ranges.

The contest closes midnight, December 1, 1940 and prizes are as follows: First prize $250.00; second prize $100.00; third prize $50.00; and twenty additional prizes of $5.00 each.

This contest offers an opportunity for the amateur to test his or her photographic skill, knowledge of composition and lighting effects, and the ability to take an indoor shot of a difficult subject—the kitchen. Sharp lines and hard gleaming surfaces, plus the fact that it is inclosed within four walls, make a kitchen more than ordinarily difficult to photograph.

There are plenty of smart kitchens throughout the country in which some 3,000,000 modern gas ranges were installed within the last two years.

Following are the contest rules:

1—Eligible to any *amateur* photographer in the U.S.A. with the exception of employees of the gas industry and their advertising agents.

2—The photograph must be of an attractive modern kitchen showing a modern gas range not over two years old; and be taken without any model (person) in it.

3—Photograph must be an unmounted black and white glossy print, 8 x 10 inches. It should be protected by cardboard to prevent breaking in the mails.

4—Name and address of contestant must be clearly printed on the back of the print, at the top.

5—First prize $250.00; second prize $100.00; third prize $50.00. Twenty additional prizes of $5.00 each.

6—Photographs will be judged solely on the merits of photographic excellence plus the modernity and attractiveness of the kitchens depicted. Announcement of the awards by the judges selected by the above Association from among prominent photographic experts and kitchen planning specialists will be made as soon as possible after the closing date. Winners will be notified by mail and all decisions of the judges will be final.

7—All entries become the property of the American Gas Association. Entries signify consent to the publication of photographs sent in. In cases where entrants submit photographs of kitchens other than their own, each must enclose with the print the written consent of the kitchen owner to such publication.

8—It is agreed that winners of prizes loan the negatives of their pictures to the American Gas Association for a period of two months for use in publicity and its own photographic service. In addition to the prize-winning entries, the Association will select photographs suitable for the same purposes and will pay $2.00 for the negative of each print selected. The decision in this selection will be final.

9—No prints submitted can be returned. No correspondence concerning prints can be entered into. Please send no other material, merely the print with your name and address, and the written consent of the owner of the kitchen.

10—All entries must be mailed to The Kitchen Contest Editor, American Gas Association, 420 Lexington Avenue, New York, and be postmarked not later than midnight December 1, 1940.

L. E. Knowlton Becomes Gen. Supt. of Providence Gas Co.

L. E. Knowlton for several years engineer of manufacture of Providence Gas Company, Providence, R. I., has been appointed General Superintendent of the company. Mr. Knowlton served as a member of the Gas Conditioning Committee of New England Gas Assn. during 1939 and was Chairman that year of the Operating Division. He is one of the Directors of the Association for the 1940-41 term.

REED'S 4 WHEEL Razor Blade Pipe Cutters

IDEAL FOR ANY TRENCH OR OTHER CLOSE QUARTER JOBS

$4.20 F. O. B. ERIE

Capacity
½" to 2"
Weight 5 lbs.

The REED FOUR WHEEL Cutter operates with a short back and forth motion through only one third of a circle. Each of the four wheels exerts the same pressure on the pipe, and all 4 therefore cut evenly and completely through the pipe at the same time.

Equipped with Reed special alloy RAZOR BLADE Wheels, which cut with remarkable ease, leave little burr, and have a long life of useful service.

A sample cutter for test and trial may be ordered on memorandum invoice, to be paid for if retained or returned for credit if unsatisfactory. Try it once, and you will use no other.

REED MFG. COMPANY
1436 W. 8th Street • ERIE, PA.

No Gas Explosion

Last week I suggested that it might not be a bad idea to reassure those people who live near to gasholders, and who, not unnaturally, see an especial menace in these holders. We could, at any rate, state with confidence that the contents of the holder have no even slight chance of exploding or adding to the force of an external explosion. Now let me quote from a cutting from the *Portsmouth Evening News* in support of that contention. In a paragraph in that newspaper reference is made to the talks which the gas company has had with local A.R.P. personnel, in the course of which it was stated that a bomb dropped from a sufficient height would pierce the holder and drop into the water beneath. One need not go on from there to surmise what would then happen; suffice it to say that the suggestion was that the gas would become ignited and burn until the holder was completely grounded. But, adds the *Portsmouth Evening News*, that is exactly what has since happened when a gas-holder has been pierced by a high explosive bomb. No mention is made of where this piercing took place and I would not tell it if I knew; but it all bears on my suggestion that a goodly section of the public morale would be supported by a simple assurance that gasholders will not "explode." It is all very well for gas engineers, with the contempt born of familiarity, to assume that everybody is equally confident; but publicity would do much to make a reality of that confidence.

The Gas Times, London, August 3, 1940.

Bethlehem Steel Awards Coke Ovens Contract

Bethlehem Steel Corporation has awarded a contract to the Wilputte Coke Oven Corporation, subsidiary of Semet-Solvay Company, division of Allied Chemical & Dye Corporation, for a battery of coke ovens for its Lackawanna, New York, steel plant.

The battery of ovens will consist of 76 under jet combination ovens having a coking capacity of 560,000 tons of coal per year, which is equivalent to approximately 32,000 tons of coke per month.

This is the first contract awarded since Semet-Solvay and Wilputte have joined forces in the coke oven construction field and it is expected that the design of the ovens and accessory equipment will represent definite improvements that will make the installation the most modern and efficient yet constructed in this country.

Engineering details are now being worked out and it is expected that the ovens will be in operation by next Spring.

Huyck and Murphy Win Promotions with Brooklyn Union Gas Company

Ansel B. Huyck, formerly Assistant Engineer of Manufacture for Brooklyn Union Gas Company, was made Engineer of Manufacture, filling a vacancy created last December when Harry L. Nickerson was elected Chief Engineer.

Samuel Green, formerly Works Engineer, Manufacturing Department, was made Assistant to Engineer of Manufacture.

Edward J. Murphy, formerly Assistant Chief Chemist, was appointed Chief Chemist, a post made vacant on July 1 by the retirement of Edward C. Uhlig.

Mr. Murphy was born in Brooklyn and educated at Pratt and Brooklyn Polytechnic Institutes. He entered the company's employ on July 5, 1905, as Assistant Chemist. On February 23, 1924, he was made Assistant Chief Chemist. He has been chairman of the chemical committee of the A.G.A. and of several subcommittees of the production and chemical committees.

Gas Appliance Sales Up

Six Months Figures Show Gas House Heating Equipment Leading with Increase of 38.5 Per Cent

Gas appliance sales throughout the United States registered substantial increases during the first six months of this year as compared to sales figures for the same months in 1939.

A spectacular rise of 38.5 per cent in the sale of gas fired furnaces for house heating was recorded during the period of from January through June of this year as compared to the same 1939 six-month period.

Domestic gas range sales rose 13.3 per cent and automatic gas water heaters recorded an increase of 12.7 per cent during the first six months of this year.

Obituary

J. ARNOLD NORCROSS

J. Arnold Norcross, former general manager of the New Haven Gas Light Co., New Haven, Ct., died August 20th at Dover-Foxcroft, Me., at the age of 70.

Known throughout the world for his work in directing the construction of gas works, Mr. Norcross retired from active business work in 1929, but had continued his interest in engineering privately. He was associated with the New Haven Gas Light Company from 1903 until his retirement in 1929.

Mr. Norcross was born in Derby on December 27, 1869. He attended private and public schools in Derby and was graduated from Stevens Institute of Technology in 1891.

He entered business as a cadet engineer with the Consolidated Gas Company of New York in 1891 and in 1893 was made superintendent for the War Department, directing the building of an entire new gas works for West Point Military Academy.

The following year Mr. Norcross became principal assistant to the managing partner of Humphreys & Glascow, London, Eng., in charge of the erection of gas works in many European cities and Shanghai, China.

He returned to this country in 1903 and became associated with the New Haven Gas Light Co. as chief engineer. He was elected secretary-treasurer in 1905 and vice-president and general manager in 1926.

EDWARD C. UHLIG

Edward C. Uhlig, chief chemist and head of the laboratory of the Brooklyn Union Gas Company at his retirement on July 1, died August 20th at his home. He was seventy-two years old.

Mr. Uhlig joined the Brooklyn Union Gas Company in 1904 as a chemist and soon afterward established the company's laboratory. During the World War he had charge of the company's production of toluol, a by-product used in the manufacture of munitions.

Mr. Uhlig was a member of the American Chemical Society, the Society of Gas Lighting, the Chemists Club, the American Gas Association, the American Association for the Advancement of Science, and the American Institute of Chemists.

GEORGE BISHOP

George Taylor Bishop, retired Cleveland financier and formerly active in the utility field, died after a heart attack in his room at the Congress Hotel, August 24th. He was seventy-five years old.

Mr. Bishop was born in Ravenna, Ohio, a son of Clark B. Bishop, a hotel keeper. He had long experience in the railroad, public utilities and manufacturing fields, in the course of which he helped to develop the North Texas Traction Company; was associated with the Washington, Baltimore & Annapolis Railroad, and was chairman of the board of the Niagara, Lockport & Ontario Power Company and the United Gas & Electric Company.

Mr. Bishop succeeded Mr. Eaton as chairman of the board of the United Light and Power Company and as director of the Youngstown Sheet and Tube Company. He had been a director of the Goodyear Tire and Rubber Company, the Seiberling Rubber Company, the Chesapeake & Ohio Railroad, the Hocking Valley Railroad and the Sherwin-Williams Company.

Mr. Bishop's home was in Northfield Center, Ohio, a suburb of Cleveland.

W. L. FEWSMITH

William L. Fewsmith, Manager of Publicity and Advertising for Robins Conveying Belt Company, Passaic, New Jersey, died after a brief illness while on vacation at Port Carling, Ontario, Canada, August 15th, at the age of 61. Mr. Fewsmith joined the Company in 1913 as a Civil Engineer and had been continuously employed both in the capacity of Civil and Mechanical Engineer until 1924 when he was appointed head of the Publicity and Advertising Department.

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The Raleigh Gas Company, Raleigh, N. C.

A Book for Gas Appliance Salesmen

Domestic Gas Appliances by A. M. Apmann. Gives practical working knowledge of the technology of appliances and characteristics of fuels. Ranges, Water Heaters, House Heating and Refrigeration are fully discussed. 238 pages, many illustrations, stiff cover. Special close-out price, 50c. American Gas Journal, 53 Park Place, New York.

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53 PARK PLACE NEW YORK

Light Oil Recovery

(Continued from page 10)

Btu Reduction in Coke Oven Gas:

Btu—Gas before Stripping	575
Btu—Light Oil Recovered	150,000 per gallon
Vapor Volume Occupied by One Gallon of Light Oil.....	40 cubic feet

Btu in Gas After Stripping:

When removing 2.00 gallons per ton of coal carbonized	550
When removing 3.00 gallons per ton of coal carbonized	537

When the gas is used for industrial purposes, the loss in heating value is a minor matter, and, as the light oil recovery system removes naphthalene from the coke oven gas, a stripped gas substantially free from naphthalene relieves the gas distribution engineer of one of his major problems.

The fact that the light oil recovery reduces the Btu in the gas is responsible for the small number of light oil recovery plants in the gas utility manufacturing industry. It is obvious that local conditions relative to the replacement of the Btu in the gas when removed as light oil must be seriously considered before a light oil plant can be contemplated for the utility field. In general, the small gas companies find it difficult to show satisfactory returns from a light oil recovery plant when they are compelled to restore the Btu by further enrichment of the send-out gas. However, there are several large installations in this country which have found it practical and economical to remove a portion of their light oil and replace it by further enrichment of their send-out gas, using heavy oil in their water gas carburetors.

You probably remember that during the World War many carbureted water gas plants installed benzol recovery systems and were operated to leave the benzol in the gas and recover the toluol for sale to explosives manufacturers. It is interesting to recall that the chief difficulties encountered by water gas operators at that time were serious emulsion troubles in the wash oil circulating system. Later experience has shown that these difficulties were due primarily to irregular temperatures in the carburetion operation of water gas sets, causing undercracking of the oils and the presence of resins and gums in the carbureted water gas which, in contact with petroleum wash oil and water in the circulating system, form serious emulsions. With modern carbureted water gas sets, wherein more uniform temperature conditions are obtained, very little difficulty would be experienced in recovering light oil from carbureted water gas. Furthermore, since the introduction of heavy petroleum oil for carburetion, it has been noted that the light oil recovered from the heavy oil operations contains fewer undercracked petroleum compounds and is more truly aromatic in character than those light oils recovered from the gas-oil carburetion operation.

Orifice Meters

(Continued from page 18)

Where gas is measured under vacuum or at extremely low pressure, more frequent changes of Fe and F_R factors will, no doubt, be necessary. Likewise, violent fluctuations in gravity, temperature, and pressure, may make it necessary to make more frequent changes in the gas coefficients.

Chart Calculations

The correct reading of the static and differential pressures, in order to correctly calculate the volume of gas measured, is an important function of orifice meter measurement.

A Chart Reader can, with proper training, read charts with sufficient accuracy to give results that will be within the tolerance allowable in the other phases of orifice meter measurement.

Where it is possible to read and calculate a large number of charts in one office, the use of integrating chart calculators, such as are on the market today, has proven of great value.

The use of such calculators has greatly reduced the cost of chart calculations and increased their accuracy. The frequency of error has been reduced.

The use of the chart calculator has also produced better customer's relationship; in that the customer has more confidence in the results obtained by the chart calculator than in the old conventional methods of chart calculations where the old give-and-take methods are more liable to creep into the picture.

Besides greatly reducing the possibility of personal error, the chart integrator has other valuable features. The accuracy of the operator in following the record of differential and static pressure, as made by the meter, can be checked because he not only follows the lines, but, since his following stylus is a pen, actually traces his line over the line as made by the meter. Any deviation between the operator's line and the line as originally made by the meter is easily seen by inspection and corrected.

Another advantage of the integrator is that it records an infinite number of time intervals, whereas any sight method must average on definite intervals such as an hour or 15 minutes.

Conclusions

The results of several years' application of the recommendations of the American Gas Association Report No. 2, on Gas Measurement, has definitely proven that their adoption will place the field of orifice meter measurement on a sounder and more dependable basis.

Both the buyer and seller can feel that they are receiving the benefits of the latest and most reliable information available to measure the correct volume of gas at all times.

While, no doubt, many troubles are still before us, nevertheless, we can feel that the fundamental problems have been placed on a sound basis and that orifice meter measurement may be adopted as a standard of measurement which is beyond reproach.

W. T. Barton Appointed P. A. of American Bosch Corpn.

William T. Barton has been appointed Purchasing Agent of the American Bosch Corporation according to an announcement made recently by the management.

Mr. Barton, who succeeds Mr. Joseph F. Drennan, newly appointed purchasing agent for the city of Springfield, Mass., has been connected with the company's purchasing department for the past eighteen years and held the position of Assistant Purchasing Agent.

Industrial Gas Exhibit at National Metal Congress

The Industrial Gas Section of A.G.A. is again sponsor for a combined Industrial Gas Exhibit, one of the features of the National Metal Congress and Exposition to be held at Cleveland, October 21-25.

This year, the Section will take 5,000 square feet of space for exhibits of fifteen leading manufacturers of gas-using equipment for the metal industries plus a central A.G.A. lounge and back-wall display. A group of gas companies serving in and near Cleveland have contributed to make available effective unified decoration for the entire space, as well as to supply competent men to man the display in addition to the manufacturers' representatives and the representatives of the A.G.A. who will be present.

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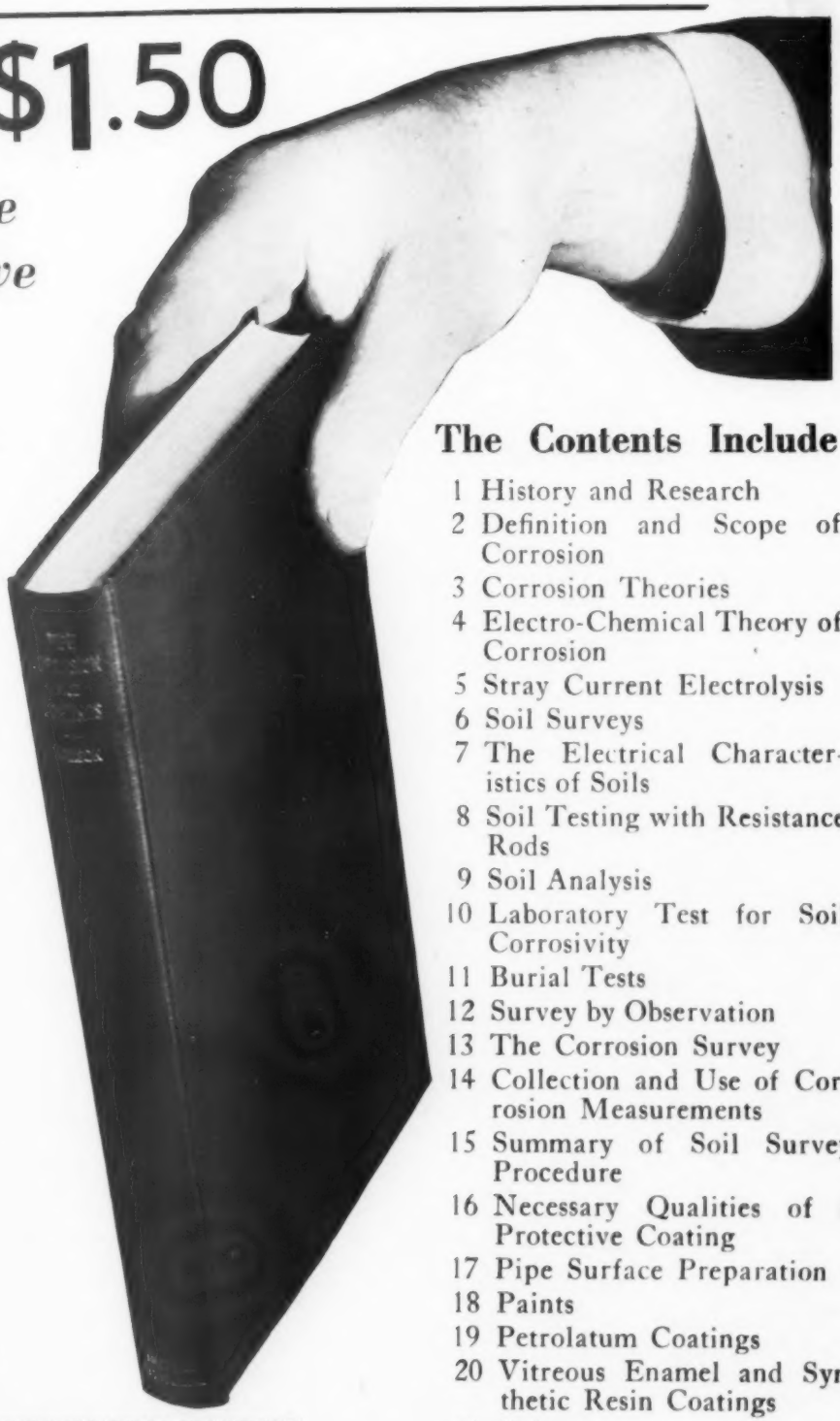

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by

Erick Larson

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